DOCUMENT RESUME

ED 062 514 VT 014 877

AUTHOR	Wenig, Robert E.; Wolansky, William D.
TITLE	Review and Synthesis of Literature on Job Training in Industry.
INSTITUTION	Ohio State Univ., Columbus. Center for Vocational and Technical Education.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
REPORT NO	Inf-Ser-62
PUB DATE	72
NOTE	67p.
AVAILABLE FROM	U. S. Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Bibliographies; Cooperative Education; *Job Training; *Manpower Development; *On the Job Training; Program Development; Program Evaluation; Research Reviews (Publications); *School Industry Relationship; *Vocational Education

ABSTRACT

It is imperative that vocational and technical educators study job training programs and policies in industry in order to develop curriculums that will enable students to make a better transition from school to work. The purpose of this paper was to gather pertinent information about job training efforts in industry so that vocational and technical educators can make informed decisions aimed at improving job training programs. More specific objectives were: (1) to describe the state of the art of job training in industry, and (2) to determine the best possible linkages that can be developed between vocational and technical education and industry. Points brought out in the study include: (1) Industry was mostly concerned about the increasing number of people-related problems, (2) Industry considers cooperative student training as the best type of vocational and technical education for skill development, and (3) Large industries are making great progress in improving job training through the use of the systems approach and better evaluation strategies. Major sections of the report include: (1) Factors Influencing Job Training In Industry, (2) The Description of Job Training In Industry, and (3) The Synthesis of Selected Job Training Programs in Industry. (Author/JS)

Information
Series No. 62
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review and synthesis
of literature on

JOB TRAINING IN INDUSTRY

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Information Series 62
VT 014 877

REVIEW AND SYNTHESIS OF LITERATURE ON JOB TRAINING IN INDUSTRY

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June, 1972

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PREFACE

Industrial job-training became a reality during World War II as the need for skilled and semiskilled workers spontaneously erupted. As more and more industries now have training and development departments, the feasibility of effective job training increases. Such historical development is considered in this review and synthesis.

The authors investigate on-the-job training as one of many job training techniques. They further illustrate possible strengths and weaknesses of job training programs.

The study concludes with suggestions for additional research of the whole concept of job training in industry.

The profession is indebted to William D. Wolansky and Robert E. Wenig, Iowa State University, for their scholarship in the preparation of this report. Recognition is also due Galer Beed, East Tennessee State University, and the personnel from two industrial training departments for their critical review of the manuscript prior to its final revision and publication. Wesley E. Budke, information specialist at The Center, coordinated the publication's development.

Members of the profession are invited to suggest specific topics or problems for future reviews.

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INTRODUCTION

Job training within industry ranges from the most casual form of pick-up training to highly structured apprenticeship programs which account for the largest part of the nation's skill development (U.S. Department of Labor, 1968a). Industry, in general, has not been completely satisfied with the type and nature of institutional job training provided by vocational and technical education. In 1962 the Manpower Development Training Act (MDTA) was passed by the U.S. Congress to subsidize job training of unemployed, underemployed, disadvantaged and hardcore. These training efforts need to be studied to determine what benefits they can provide for improving vocational and technical education.

The purpose of this study is to gather pertinent information about job training efforts in industry so that vocational and technical education can make informed decisions toward improving its job training programs. The authors, being aware of this purpose, set out to (1) describe the state of the art of job training in industry and (2) to determine the best possible linkages that can be developed between vocational and technical education and industry.

It was decided that the level of job training would only include the semiskilled and skilled areas (excluding apprenticeship training). The authors know that apprenticeship training is a skilled-type training program that vocational and technical education is highly concerned with. However, it was felt that there is considerable information in ERIC and the U. S. Department of Labor about apprenticeship training in industry and to go over the same ground again may not be to the purpose in this report. In addition, the impact of apprenticeship training in industry is slowly decreasing to approximately 10-14 percent of the means of producing trained workers for industry. Apprenticeship training is still a vital part of producing skilled industrial workers, but will not be discussed, except as it relates to cooperative ventures in on-the-job training.

The securing of information for the report was limited to the review of pertinent literature that was available from libraries, reports and documents provided as a result of the mailing out of request letters to specific agencies, organizations, and societies, and several personal interviews. The ERIC system was searched by using appropriate descriptors but the authors found little relevant information on job training in industry.

Evidence of the difficulty of finding specific information about job training in industry was substantiated by a letter from Russel B. Flanders, Chief of the Division of Manpower and Occupation Outlook of the U.S. Department of Labor, Bureau of Labor Statistics. He said that a survey of the 1967 Presidential Task Force on Occupational Training in Industry " . . . concluded that the most serious information gap it encountered was the lack of comprehensive data on the nature and scope of training in private industry" (U.S. Department of Labor, 1968a, 1968b).

Even with the lack of specific information of job training in industry, the authors felt that with the synthesizing of numerous pieces of data, a global sketch of industrial training could be provided. The authors gathered information with emphasis on the benefits that could accrue for improving vocational and technical education. With this statement as a criterion, the authors tried to determine from the collected information the strengths and weaknesses of job training which could help educators do a better job for future industrial workers. Further, it was imperative to determine ways and means of improving the relationship between educators and industry, as these relationships affect needed training and articulation of training requirements.

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REVIEW AND SYNTHESIS OF LITERATURE ON JOB TRAINING IN INDUSTRY

FACTORS INFLUENCING JOB TRAINING IN INDUSTRY

Historical Perspective

Historically, in the United States the type and amount of job training in industry has been dependent upon changes in political, economical and societal forces. For example, as reported in a U.S. Department of Labor Report (1968a) training in industry today within the last 10 years was forced to change due to:

1) society's and industry's concern with human resources;
2) unemployment and underemployment;
3) scientific and technological advances;
4) organized labor's demand for better wages, welfare benefits and working conditions; and,
5) employer requirements for workers.

Several other training problems were mentioned by Rubin (1968), who stated that, because of a changing technological work environment in modern industry and dilution of skills required of a job, the worker is making two profound behavioral adaptations, i.e., a noticeable increase in mobility between jobs and a changing basis for calculating job satisfaction. Palmer (1954) indicated that workers not only change jobs approximately nine times during their working lifetime, but the majority also change occupations and the industry in which they work. As society becomes more complex job training will need to change to cope with these shifting demands.

Evans (1971) stated that industry's decision on whether to provide job training has mainly hinged on economic motives. Today, however, most union contracts have some stipulations for job training which is a form of societal benefit to the worker made possible by political and economic forces. Mager and Pipe (1970) indicated that historically industry has identified lack of job training as the problem to low worker productivity when in fact it is merely a symptom of the problem in human performance.

There is little information prior to World War I about formal (structured) and informal (unstructured) job training provided by industry. Of course, someone would argue that job training was present even though informally, because it was forced upon workers by employers with the coming of mass production. According to Roberts (1965) job training came to be recognized during World War I and further amplified during World War II due to the increased demands for semiskilled and skilled workers. Evidence of the amount of armed service training was reported by Clark and Sloan (1964) who studied vocational education in the military. They estimated that the armed services had more persons in training than all the private and public colleges and universities

in the United States combined. With such vast training, returning servicemen from World War II and the Korean conflict would naturally reduce industrial job training demands for the semiskilled and skilled worker. However, these G.I.'s required further training both formally and informally which was provided through cooperation between educational institutions and industry.

Part of the historical development of job training in industry and its rise to influence was due in part to the addition of training and development departments to industrial firms. This occurred because both management and line supervision began to see the ineptness of their own training ability and the haphazard training and development programs. Today, most larger corporations such as Ford, General Motors, IBM, Sperry Rand, Portland Cement, Caterpillar Tractor and numerous others have training and development departments which are supervised by a training and development director.

A training and development director's responsibility is to work with both top management and labor to accomplish a broader and more adequate training program for all levels of workers. Malcolm Warren, the Training and Development Director for the Quester Corporation, Toledo, Ohio, said in conversation (1971), "The performance of training and development directors and their departments to meet job training needs has not succeeded as hoped for by management." Due to this performance discrepancy, the training and development departments have not reached management expectations, however, they still command considerable influence in the area of job training.

The New Economics of Job Training

In the past, and even some say today, job training only takes place as the economic position of a company is favorable, that is, as profits shrink, so does job training. Evans (1971) stated that there was little cost-benefit evidence of job training methods (either company job training or outside recruitment) on which management could make an informed decision as to meeting its manpower needs. He further stated that the availability of skilled and experienced personnel from the job market usually meant that management selected outside recruitment as the better way of meeting manpower demands. However, according to Winston (1969), McKee (1969), and Livingston (1971) the position held by management has today changed from viewing job training as a short-term in nature to a long-term investment as a factor for economic planning and stability.

Several factors worked against the change of management's position toward job training. First, during periods of greater manpower needs management sought trained workers from similar industries, armed forces and specialized training institutions. Second, during low or poor economic conditions an industry could solicit trained workers from similar industries by offering higher pay. Lebergott (1968) stated that industry must be induced to sponsor more training, so that the process of employers bidding workers away from each other be reduced or eliminated because it would tend to raise wages; hence, cost of labor would go up, which in turn, would raise the price of consumer goods and services.

In a highly competitive market, those industries which have training programs could, in essence, sell their products at a lower price. Management, therefore, soon realized the benefits of conducting its own training program. This concept was supported by Livingston (1971) when he stated that the total cost of training activities does not apply against the profits of the year in which the costs are incurred, but is spread over the entire period of time that training is expected to influence corporate income.

Apparently within the past decade management has modified its attitude about training and its willingness to invest in training for economically sound reasons. This important premise was supported by Likert (1967) when he stated that not only are trained workers a long-term capital investment, but also the cost can be depreciated. This idea grew out of the realization that management would not expect productive efficiency from untrained personnel assigned to operate expensive and sophisticated equipment. To complement these ideas of economic benefits of job training to industry, McKee (1969:27) stated "some $30 billion are spent yearly in the industrial education and training process . . . Clearly, training has arrived as a positive force."

On the contemporary industrial scene there are internal forces calling attention to ineffective job training before it curtails a company's ability to compete economically. Today, the more aggressive companies, through systems management techniques, usually become aware of training inadequancies which result in drastic altercations of their total job training programs. These firms take this position so they can compete economically with competitors. McKee (1969) supported this concept in his statement:

> Fortunately, there has been a growing realization of the value of training. It can be said, without fear of contradiction, that American industry has reached the point where it is generally accepted that systematic job training will make significant contributions to achieving organizational objectives. (p. 27)

These economical factors have triggered, among other things, several additional benefits to industry, namely, better trained workers who are more flexible and adaptable to changing demands. These same workers have fewer accidents, higher production records, less absenteeism and less worker turnover. Winston (1969a:31) agreed when he stated "training can be used to reduce cost, help marketers to sell better, increase worker productivity, lower waste, and improve quality control." With this type of outlook held by industrial management about training and development of workers, not only will better training programs result, but also industry will be making an ever increasing contribution to meeting the political, economical, and societal forces in our technological environment.

The success of changing management's attitude toward the benefits of operating a job training program is due not only to economic factors, but also to an organization called the American Society for Training and Development (ASTD). Through the leadership of both its executive officer and membership improved training programs were made possible. The research and development work of its membership is disseminated through the society's monthly publication called, "Training and Development Journal." According to Warren

ASTD's leadership in research and development of training and development programs has influenced management on the worth of investing in job training.

Economics and Manpower

It is well known today that apprenticeship training accounts for the preparation of only about 10-14 percent of skilled manpower development for industry. If published indications are correct, apprenticeship training will not rise, but drop, because today's industry is changing to a more cybernetic production system. According to a report issued from "Trades Meeting on Technology" (1971) this new cybernetic technique applies even to the making of tools and dies which in the past was strictly a craftsmen's domain. Froamkin (1968:484) reported "automation has reduced the necessity for skilled workers. Even the maintenance workers for automated industries only require semiskilled workers."

Coupled with the above concerns is the U.S. Department of Labor Report (1968a) which stated that persistent national problems of unemployment and underemployment, with attendant social and economic ills, paradoxically coexist with widespread job vacancies in a variety of occupations and industries. One can also observe, through reports from the Bureau of Labor Statistics, many future changes in the economic and manpower situation. Several of these future changes and concerns are:

1) Diminished need of manufacturing production workers and increased need for service trained personnel;
2) Encouragement of industry by government-sponsored programs to train the hardcore unemployable, the underemployed and the disadvantaged;
3) Legal restrictions over discrimination against older workers requiring industry to hire or retrain and continue to employ the older worker; and,
4) The influx of more blacks, women, and youth into the labor force.

These groups are certainly influencing the economic and manpower picture of our society through increased unemployment, welfare costs, and the zest by some to gain a better socioeconomic position. Another recent societal problem is finding employment for returning Vietnam servicemen.

One major factor of change taking place in the economics of manpower training, as indicated in the *Bi-Weekly Manpower Report of Manpower Information Service* (March 11, 1970), is the present day individual worker who is not satisfied with learning just the skills of a job. The report went on to state that the trend in manpower training was the incorporation of components well beyond the actual skills of job training. These components include a variety of supportive efforts designed for the benefit of the prospective employee as well as for the actual work assignment. The former type training was strictly limited to informal, narrow information which promoted the concept of job "how to" and not "why." As reported in The New Careers Development Center newsletter (Garnter, 1971) the above approach locked the trained worker into a dead-end type job rather than one which gave him the opportunity to gain not only

vertical mobility (upward progression) but also horizontal mobility (a chance to do different types of work at the same level of competence).

An example of what happens to employees who are provided an opportunity to progress in a company was reported by Hubbell (1972). His article discussed how Bill Marriott operated his corporation so that each employee has the opportunity to be involved with his "career progression" program. Through the spending of a million dollars a year on training programs each employee can progress up a career ladder. New employees, regardless of race, creed or color, who have worked at least three months and are approved by their supervisor, can try any number of new jobs on an experimental basis for an hour or two each day. Several employees have become millionaires because of the Marriott employee opportunity program.

To help both industrial trainers and vocational and technical education to plan appropriate manpower training programs for the future it is necessary to have some projection of needs over the next 10 years. Two similar reports based on the Bureau of Labor Statistics about future manpower needs include Harold Goldstein's study (1971) and "Where the Jobs Will Be in the '70's" (1971). Both reports identified the manpower demands for the 70's, the changing character of major occupational groups and individual manpower needs within specific occupations. Hopefully, these manpower need projections will help trainers of workers, in both industry and education, to prepare appropriate programs in line with what we know about learning and the workers' attitudes.

Definition and Purpose of Job Training

A definition is provided for purposes of this study and for the benefit of the reader. Job training in industry covers those training techniques which are worker oriented, not management or supervisor oriented, are done during the regular working hours of occupation, and for which a minimum or beginning wage is paid. This definition includes an array of job training techniques used within private industry, one of which is on-the-job training.

According to an American Vocational Association Bulletin (n.d.) entitled *Definitions of Terms in Vocational, Technical and Practical Arts Education,* on-the-job training is defined as "instruction in the performance of a job given to the employed worker by the employer during the usual working hours of the occupation. Usually the minimum or beginning wage is paid." One will note both definitions are similar. However, the definition for this study includes any job training techniques in industry and not just one type such as on-the-job training.

To further define the parameter of this study, job training will only include those semiskilled and skilled worker-training techniques (other than apprenticeship training) which take place entirely within the confines of specific industries. For purposes of clarity, the terms "semiskilled" and "skilled" exist on a continuum from zero to 80 hours for semiskilled and 80 or more hours for skilled training. These two classifications are defined as:

1) Semiskilled training - any type of training that can be accomplished within 80 hours or two weeks whether informal by a foreman or formal by a company trainer.

2) Skilled training - the type of training that requires more than 80 hours or two weeks to complete and which can be both informal and formal training or formal training only.

The reason for such limitation is vocational and technical education's primary concern with these training levels.

The purpose of job training in industry is dependent upon many variables, such as size and type of industry. However, there appears to be some common agreement on job training's specific use by industry. For example, Roberts (1965) and Evans (1971) stated that the specific use of job training by industry would be to train a newly employed worker, to change an existing employee to another position, to promote a worker, to produce and service a new product, to initiate a new manufacturing procedure, or to increase safety.

THE DESCRIPTION OF JOB TRAINING IN INDUSTRY

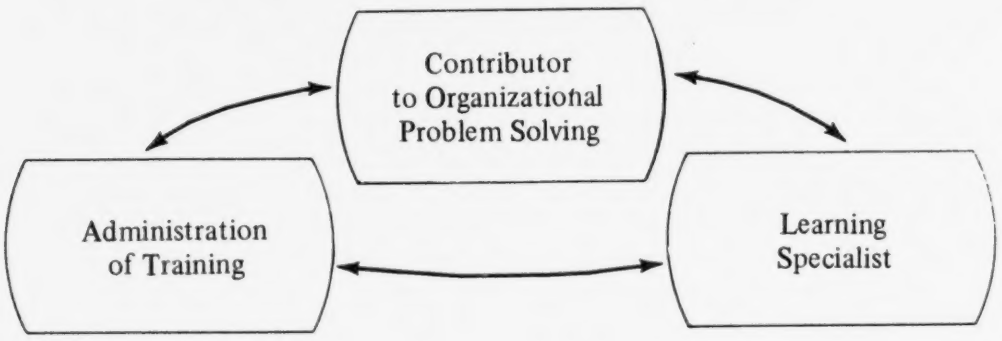
A categorical description of selected job training programs in industry as synthesized from the literature will be presented in this section. Specifically, the review will cover those job training programs at the semiskilled and skilled levels of training. To provide a structure for this task the authors have chosen to classify the description into five categories: organizations, content, methods, facilities and cost.

Job Training Organization in Industry

Organization, as defined for this study, consists of both structure and purpose of job training in industry. By structure we mean its vertical and horizontal properties and interrelationships. By purpose we mean both the end goals or outputs of a training program and its influence upon organizational structure.

One cannot logically study the organization of job training programs without first determining the roles of the training and development personnel. Lippitt and Nadler (1967) identified in Figure 1 these roles of training personnel which have emerged through the years.

FIGURE 1
KEY ROLES OF TRAINING AND DEVELOPMENT PERSONS IN THE ORGANIZATION (Adopted from Lippitt and Nadler, 1967)



Nadler (1969) modified the Lippitt and Nadler (1967) model, as shown in Figure 2.

FIGURE 2
TRAINING DIRECTOR'S ROLE IN THE ORGANIZATION
(Adopted from Nadler, 1969)

Directive Consultation to the Organization

1	2	3	4	5
Advocate	Expert	Alternative Identifier	Catalyst	Process Specialist
Pervader Management	Gives Advice	Indicates Possibilities	Seeks Questions	Maximum Quality of Problem Solving

Non-directive Consultation to the Organization

The specific application of the model in any organization, according to Nadler (1969) was dependent upon (1) the trainee's personality, (2) the relationship between the training direction and management including his portion in the hierarchy, and (3) the problem itself.

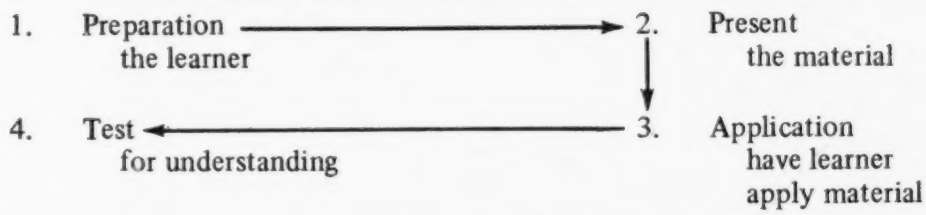
Nadler (1969) specifically stated "the training director is one of the key company personnel who has the responsibility for helping management meet its commitment." Winston (1969) agreed with Nadler when he indicated that the trainer's role is to enhance the organizational and individual performance. He went on to state that today trainers have begun to fulfill a critical function to a firm's meeting its entire organizational objectives.

Training and Development Organizational Models

Recently, the training and development officers of industry are becoming more instrumental in organizing the structure of job training which follows a more systematic path than that of a few years ago. Warren (1967) stated that most of these industrial trainers were applying the systems approach to increase the possibility of developing a training structure which would be all inclusive of a company's components found within job training. A systems design, according to Johnson (1963:89), would provide the overall framework for implementing the systems concept. Johnson further stated that a systems concept is structured to serve a dynamic situation, identify responsibilities and effectiveness, and adjust activities as situations change. A perspective can be gained of the changes that are taking place in past training models, due to the application of systems techniques to job training organization, by studying the following examples.

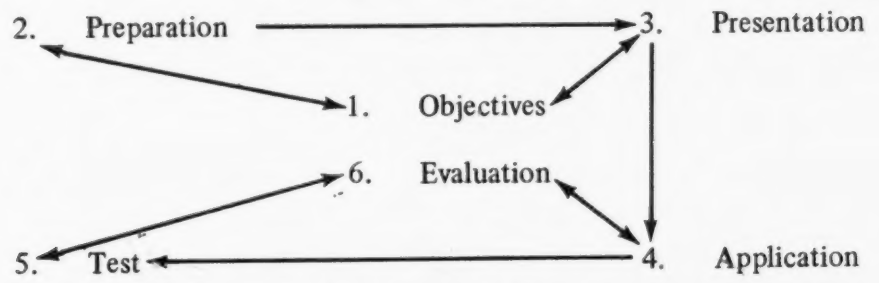
The first model deals with changing the traditional four-step methods of training to one of six steps. The most traditional training model structure for industrial training has been known as the four-step method (see Figure 3).

FIGURE 3
THE TRADITIONAL FOUR-STEP TEACHING METHOD



It has been used so religiously in training of vocational teachers that some teachers who have been trained by this four-step method fail to change to other more pertinent designs. Ford (1970) indicated the four-step method no longer to be adequate in today's training concept because of the shift of training interests to what the learner does rather than what the instructor does. Ford (1970) expanded the four-step method to six (see Fugure 4). This model, said Ford, was

FIGURE 4
THE EXPANDED FOUR-STEP METHOD OF INSTRUCTION
(Adopted from Ford, 1970)

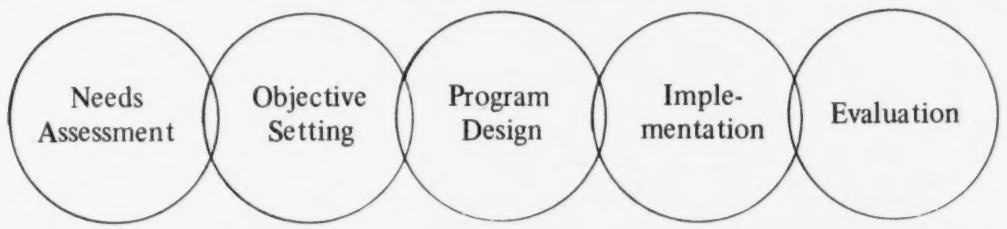


neither a step-by-step procedure nor a design of how people learn, but only a frame of reference for organizing and teaching adults singly or in small groups.

The addition of objectives and evaluation to the traditional four-step method is vital to any instructional organization. If objectives were not stated specifically enough, noted Mager (1962), there would be no way of determining effectiveness of training. This effectiveness relates to cost benefits, time, selecting appropriate content and method and student attitudes for changing behaviors (Rose, 1968). By the same token, evaluation has added assessment not only at the end of the training cycle, but, wisely, during the entire period of instruction. This latter significant concept of evaluation adds systematic monitoring to the entire training program from beginning to end (Alkin, 1970). It should be added, at this point, that no systems model could correct certain organizational problems which might lead to not meeting objectives. Mager and Pipe (1970) concurred with this statement and offered a decision-making scheme to help a trainer determine whether his problem is due to training or to some subtle factor that is preventing an organization from meeting its objectives.

A second example of change in training models is found in a traditional versus totally-integrated systems model. A traditional system concept of training usually refers to a particular model or structure of training. The steps in the traditional systems model, as shown in Figure 5, are frequently thought of as

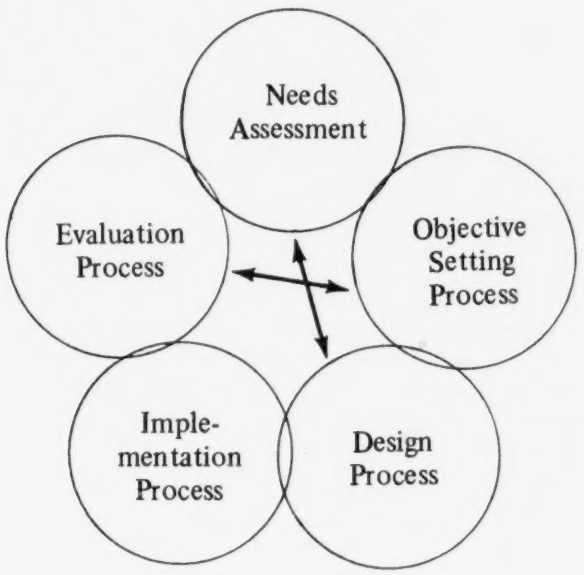
FIGURE 5
THE TRADITIONAL CONCEPTS OF THE TRAINING MODEL
(Adopted from Miller, 1969)



discrete phases of development. Miller (1969) stated that this design could lead to inaccurate training results. That is, needs-assessment data are prematurely arranged and stated as training needs, which results in objectives being stated in very general and unmeasurable terms that are not related to real training needs. This event leads to the designing and implementation of programs which are irrelevant to real life circumstances faced by trainees. The results from this design are that training increasingly leads to more general and less precise training efforts.

A better approach to training, stated Miller, would conceive it as an integrated process. That is, each sub-process would not become a final

FIGURE 6
CONCEPTION OF THE TRAINING MODEL AS AN INTEGRATED PROCESS
(Adopted from Miller, 1969)



statement, but would continually be reworked to develop better objectives, questions and answers (see Figure 6).

A third example of a change in training models is given in Figure 7 as a total systems training model developed by Renton (1969). Industry, like education, has been faced with numerous types of new training programs or curricular structures. The improvement of job training, relative to these new approaches, is usually done on a hit or miss basis in both education and industry. Some industries have hit upon a more systematic and critical procedure with which to gain a satisfactory return on their investment in training.

FIGURE 7
FOUR-PHASE TRAINING AND DEVELOPMENT CYCLE
(Adopted from Renton, 1969)

Below is a practical industrial example or case study to explain how Renton's model was used incorrectly for a job training problem. This approach was applied by a training officer in a fertilizer factory to cut down the number of accidents among new laborers loading fertilizer bags into railway trucks. The training officer and loading foreman followed the above four steps to develop a four-day course to train the new laborers. The training course was presented, and the training officer and foreman were extremely pleased with the accomplishments. However, upon evaluation analysis of the trained laborers versus the new non-trained laborers, the results indicated no significant difference between the two in reducing accidents.

The mere application of the four-phase basic training and development cycle used to develop the new training course for the above situation did not succeed in reducing accidents among new hirees. In describing the above actual situation, Renton explained that the correction of this training flaw would require a much more systematic and critical approach to the development of in-company training programs. He further stated that more energy must be exerted to delineate the problem which planned training is to solve before any judgment is made about setting of specific priorities. The application of a Training and Developing Check List can augment the possibility of gaining a successful training program. Renton (1969) has developed such a check list as illustrated in the following:

Phase 1: Identify Priorities for Training Improvement

Phase 2: Analyze the Job or Operation

Phase 3: Plan Training Strategy
Phase 4: Develop the Training Course
Phase 5: Classify Candidates for Training
Phase 6: Provide the Training
Phase 7: Follow up the Training
Phase 8: Evaluate and Improve the Training

The application of a total systems flow-block diagram to give training direction for developing worker standards on the job can be seen in Figure 8. This system serves as a valuable decision-making device for directing the new employee to a job performance level comparable to his ability and job requirements. The guide also saves training time, reduces training cost and maximizes employee self-initiative because of his exact knowledge of what is required of him to meet company job standards.

Training and Developing Structures

The actual structure of accomplishing training within an organization will vary with the type and nature of job training. The responsibility for training is usually held by the training director who may plan the type of program by applying the systems approach which was discussed above or through a variety of approaches that are appropriate to his needs.

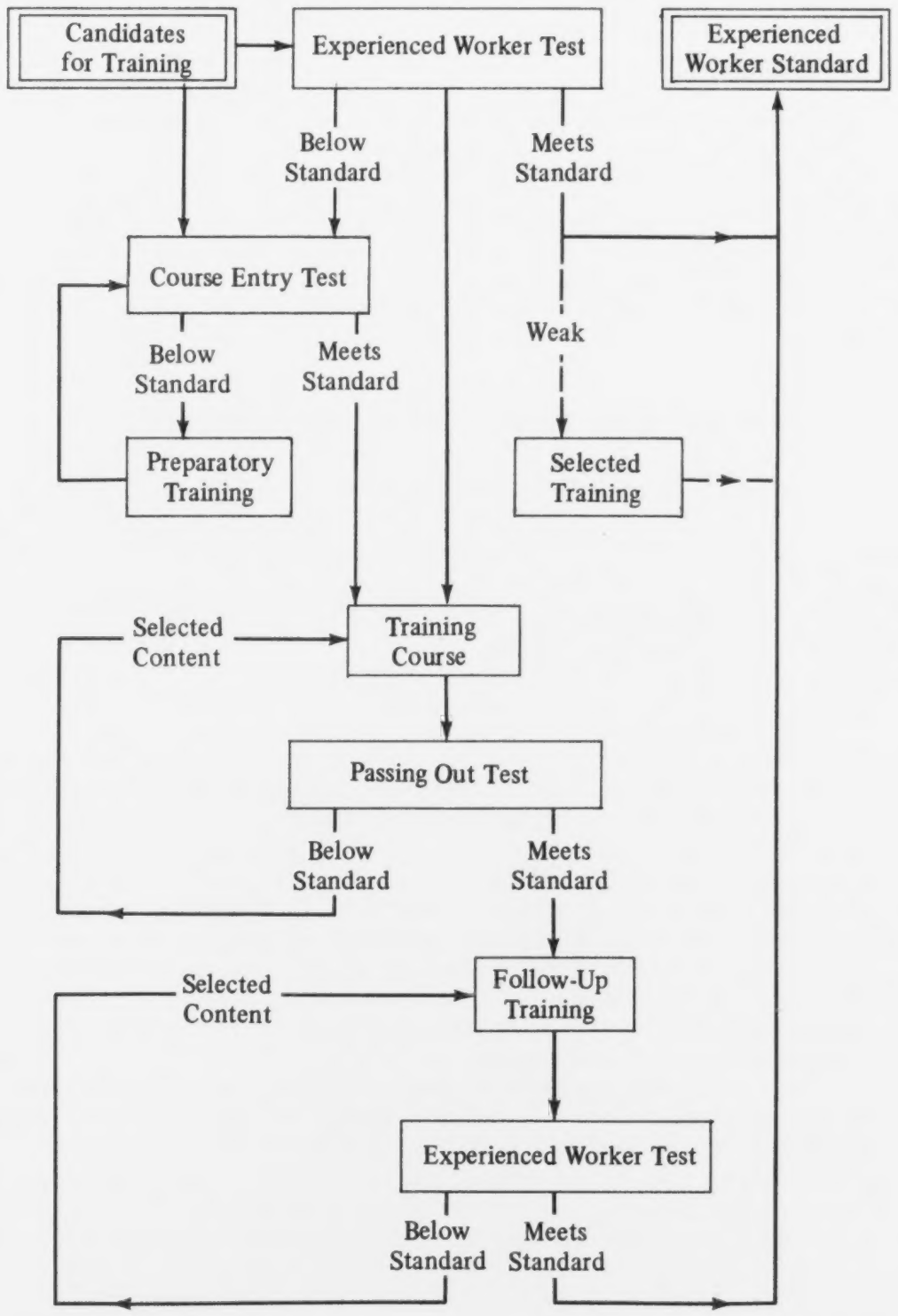
The training director most often designates the personnel to carry out the job training program. For example, on-the-job training within an industrial organization might vary according to the following structure (Roberts, 1965:404):

1) A training department apart from the production line to which trainees are assigned for training, being reassigned to production line upon completion of the training.
2) A training department established to work on production jobs and manned by specially qualified workers. Trainees are first assigned to this line and reassigned to regular work upon the completion of training.
3) The use of qualified employees to work with trainees individually and assist them in the performance of the job assigned. Trainees are shifted to similar jobs in other departments when given the necessary instruction on the job.
4) The placing of trainees on practical jobs within the range of their abilities, with the understanding that they are to work with experienced men who have been given responsibility to instruct the trainees.
5) The assigning of new or untrained workers to jobs, giving them brief instruction and letting them learn as best they can.

The specific benefits of each of these structures, or combinations of each, would depend upon the type and purpose for which the job training program was developed.

Today, the structure and purpose of job training in industry should follow a path which maximizes the trainee's efforts to meet the challenges, the problems, and the opportunities found in a technological society, and should put the trainee in maximum control of his faculties to gain full self-actualization.

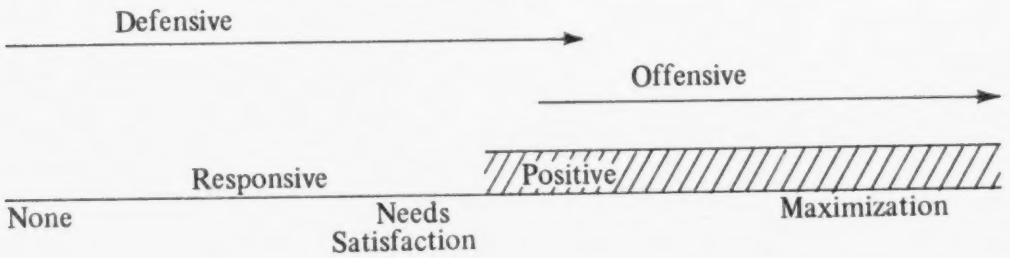
FIGURE 8
TRAINING ROUTE TO EXPERIENCED WORKER STANDARD ON THE JOB
(Adopted from Renton, 1969)



With the above thought in mind, the job training structure in industry appears to be changing from industry's concerns entirely to one that considers both the employee as well as the employer. An example of this new approach to training is given in a New Careers Development Center newsletter (Garnter, 1971) which states that the new careers training design is based upon the assumption that large numbers of workers want significant upgrading, and are less willing to accept dead-end jobs. It is based upon the belief that an advanced society will need workers more trained and educated in terms of job requirements, awareness of their new and broader status and personal development.

This training-approach design's main thrust is to foster higher worker motivation, broader knowledge and a more meaningful job experience so the worker can gain greater job mobility and satisfaction. The structure and purpose of future-oriented job training is more concerned with both the worker's motivation and his job performance skills. Figure 9 illustrates the variance in training structure that falls on a continuum from no training to maximum training.

TABLE 9
TRAINING FUNCTION ROLE (Adopted from Palmer, 1970)



To understand how the continuum works, we will first explain what the terms mean. None means no formal training with hands on activities or explanation; a hit-or-miss type training. Responsive means negative training or training for no reasons. It attacks symptoms instead of the disease. Needs Satisfaction means normal type performance which can be improved by training. Training is valued by the individual. Positive means the use of creative utilization of human resources to go on the training offensive. This concept uses all of a corporation's personnel to gain both individual and company pay-off benefits. Maximization means optimum training approach to improving people. Management believes in the humanistic approach to training. This results in gaining the highest worker motivation, for, as the worker grows in his job, management gets total worker effort.

The shaded area represents an attempt to change from a training program of reaction to one of vested demands and, ultimately, to one of initiative. Palmer (1970:39) wrote succinctly about the training function role:

> It is the responsibility of those of us in training to understand what is taking place around us, and what the implications are for us and our respective organizations. We must prepare ourselves to meet our responsibilities, for only then can we train others to successfully meet the challenge of our changing environment. To do this, it seems

> to me we must first identify where we are on the training line, decide where we must go, and then determine how best to get there.

The future question of job training according to the information reviewed in this study perhaps will provide the type of job training which will promote trainee motivation instead of dehumanization and exploitation. Janson (1970:7) concurred with the above statement when he stated:

> One of the biggest questions facing industry today is the people question . . . how to motivate employees to achieve the goals of a company and at the same time meet employees' needs.

Federal Support to Manpower Training and Development

Due to several of the concerns mentioned in the first section titled "Factors Influencing Job Training in Industry," i.e., unemployment, underemployment, influx of youth and women into the labor market and advanced technology, the federal government has initiated various types of corrective programs. These programs, according to Greenleigh Associates (1968), not only provide specific skill training to perform this job in industry, but also provide the trainee needed support required to remedy his basic educational and personal problems.

A total organizational perspective of the federally assisted manpower training and support programs can be found in a U.S. Department of Labor summary guide (1970). Three of these federally assisted programs relate specifically to this study, i.e., (1) MDTA Act (Title II) On-the-Job Training (OJT) August, 1962, (2) MDTA training in redevelopment areas 1961, and (3) Job Opportunities for the Business Sector (JOBS).

The first program mentioned above provides instruction combined with supervised work under contracts with public and private employers at the job sites for unemployed and underemployed persons 16 years of age and over, two-thirds of whom are disadvantaged. Preference is given to persons at least 18 years of age. The number of first time enrollees in fiscal 1969 was 85,000 (U.S. Department of Labor, 1970:194).

OJT provides classroom and on-the-job training associated with area economic development for unemployed and underemployed residents of redevelopment areas designed by the Economic Development Administration. Trainees number approximately 17,000 (U.S. Department of Labor, 1970:195).

The third type program, Job Opportunities in the Business Sector (JOBS), March, 1968, and presently called National Alliance of Businessmen (NAB), is concerned with encouraging private industry to hire, train, retrain and upgrade hardcore unemployed and underemployed individuals 18 years of age and over. Initially, it was limited to major metropolitan areas but has been expanded on a nationwide basis in fiscal 1970 (U.S. Department of Labor, 1970:194).

These three programs and the many other government supported programs in the 1970 summary guide should be reviewed for the purpose of becoming aware that the federal government is supplying considerable funds to other related agencies besides those specifically dedicated to vocational education.

Burt and Striner (1968) indicated that one reason that the federal government supported these related organizations was the lack of both concern

and ability of public school education to provide adequate job training for the disadvantaged. Also, the federal government is highly interested in assisting various organizations, agencies and industries to help take the unemployed off welfare. This is substantiated by a U.S. Department of Labor report:

> public support of occupational preparation can be justified if it adds social benefits equal to the cost over and above those which would have been privately provided . . . to "purchase" a job for a person who might be a burden upon himself or society is justifiable public policy. (1968a:174)

Job Training Content in Industry

With the advent of the 1962 MDTA and industry's increased social consciousness and concern for minority groups, as well as an advancing technology and increased number of youth and women workers, job-training content has taken a marked change. This change, according to Janson (1970), is away from mere job-skill content to training content that is worker-oriented. Worker-oriented content for the hardcore, stated Peterson and Rash (1969), was pre-job conditioning. Nadler (1970) identified pre-job conditioning as attitude changing and remedial education, which would augment the possibility of successfully training the hardcore.

As noted before, the type of training for the hardcore unemployed and disadvantaged individuals includes more than the traditional skill-base content. In fact, the type of content provided for the worker includes the basics of education, such as mathematics, science, reading, spelling and communications. These individuals also have many personal deficiencies, which need correction even before they can have successful job training. This content includes human relations, responsibility, family planning, housing, legal service, financial counseling, health care, transportation, recreation, drugs and personal appearance.

Another far-reaching change in the traditional semiskilled and skilled content is found in job training for the advancing new technology. This idea is supported in the article titled, "Trades Meet on Technology" (1971:2):

> For UAW craft members, the skills required by new and changing technologies have started to take shape. . . . For example, computer programmed operation, numerically controlled machines, and technologically affected maintenance systems are becoming fact rather than conversation in a growing number of plants and shops . . . industrial robots present immediate challenges to, for example, maintenance skills.

Certainly, as new technologies develop new industrial materials and processes, the content of job training in industry will need to change drastically to cope with the manufacturing and service of these new devices.

Broader Job Training Content

The breakdown of the broad content into specific areas will give one an idea of the specific areas of knowledge now covered in industrial job training. These specific areas are:

Human Relations

Causes of human behavior
Individual differences
Performance and abilities
Development through training
Motivation
Individual company goals
Solving the problem of frustration
Attitudes and understanding them
Seeking help through counseling
Importance of group attitude
Communicating
Responding to leadership

Health Related Information

Personal hygiene
Proper diet
Adequate sleep
Drugs
Diagnosis and care of specific diseases
Recreation
Family planning
Housing

Financial-Legal

Family budgeting
Consumer buying
Borrowing
Living and working within the law
Legal service

Job Related Factor-Orientation

Transportation
Safety and security measures
Identification badge
Company history and philosophy
Description of company regulations and policies
Union contract
Absenteeism: chain of command
Orientation to work environment
Worker benefits

Labor Information

Seniority provision
Job classification
Licensing in specifics: occupations

Collective bargaining
Grievance procedures

Specific Job Content

Use of manuals
Safety
Job environment orientation
Specific skill needed for job

Industrialists say that the workers of today are just as interested in nonfinancial rewards from work as financial rewards. Since Elton Mayo's (1965) Hawthorne experiment at Western Electric in Chicago, industry has known that increased production is based on more than job knowledge and pay. However, Clark and Sloan (1958:64) indicated that productivity can usually be increased by training the below average and motivating the above average worker.

Job-training content found in industry has changed from knowledge merely to perform a job to many related areas of knowledge. The related areas of knowledge are equally, or more, important today than years ago. This change has been brought about by increased knowledge about motivation and its relationships to productivity of the worker (Janson, 1970).

Job Training Methods of Industry

Methods, as defined for this study, designate those processes of transferring content to the intended learner, specifically, the actual training techniques involved in developing a semiskilled or skilled worker who can perform his job according to a specified standard. The actual method of training is dependent upon the trainee's readiness for training, the specific structure of the content, the best sequencing of training and the underlying objectives of the training.

As was noted in the beginning of this section under the title, "Job Training Organization in Industry," many industries are turning to a systems approach in order to provide a more comprehensive and totally integrated program of training. This approach involves the step-by-step procedure which identifies the selection and organization of training activities, or methods, which will best transfer the selected content to the worker with the least frustration and greatest proficiency.

Recently, it has been realized that most industries involved in job training of semiskilled and skilled workers depend upon informal training methods. This is a hit-or-miss, trial-and-error approach, which makes it extremely difficult to judge effectiveness and efficiency. Part of this inadequacy is disappearing due to the influx of federal support for training.

To provide an overview of job training and retraining methods used by industry, three information sources will be used. The first source will consist of surveys performed by government and private individuals. Secondly, the information will include training case studies from selected private industries. Thirdly, the information will consist of a review of a few selected articles and reports.

Research Surveys

The first set of surveys studies was conducted by the U.S. Department of Labor in 1962 and 1963. These were used by the U.S. Department of Labor's report (1968a) to determine the amount of government commitment to manpower training and development. The results of this report, which support the 1962 and 1963 surveys, provided some interesting data in summary below:

1. Formal training
   a) Formal occupational training has played a relatively limited role in the training of the skilled American worker. (Formal training as defined by the 1963 survey was that type of training which was mostly limited to classroom instruction.)
   b) Only 30 percent of the workers canvassed in the 1962 survey indicated that they had learned their current job through formal training programs, i.e., in schools of all kinds (including full time company training schools of at least six weeks duration, apprenticeships and the armed forces.
   c) The 1963 survey found that approximately 56 percent of the workers had learned their job through on-the-job training.
   d) In a 1962 Labor Department survey of employers, it was determined that only one in five of the larger industries was giving formal training and that over 50 percent were not skill-oriented but safety-oriented. Also, goods producing industries were providing formal training more often than the service industries.

2. Informal training (1963 survey)
   a) It was reported that eight percent of the workers surveyed indicated that no training was needed for their current jobs.
   b) It was reported that 56 percent indicated they had learned their jobs through on-the-job training. This training included instruction from supervisors or fellow workers, "working their way up" and company training courses (part- or full-time for less than six weeks).
   c) It was reported that 45 percent indicated casual learning. In this category, learning from a friend or relative or "just picked it up" were included as sources of training.
   d) Approximately 30 percent of the respondents said they had learned their current job in apprenticeships and through formal training programs found in schools.

The 1963 survey also indicated that the occupations that used informal were of the lower level jobs involving less complex skills. An example of the methods used for informal training is given in a study of 20 manufacturing plants conducted by Doeringer and Piore (1966), to determine the mechanisms these manufacturers used to adjust the available labor force supply to the requirements of blue-collar jobs. The study concluded that the variable which

appeared to carry the major burden of adjustment was in-plant training. It would appear that the in-plant training, at least for the blue-collar production and maintenance jobs covered by the study, was predominatly a process of informal, on-the-job training in the process of production.

When Doeringer and Piore surveyed the 20 manufacturing plants, they found that the in-plant, informal training, termed "osmosis" by one observed, was the predominant pattern used for teaching new workers. Some new employee watches a demonstration and then is put directly on a machine. On more complex jobs the novice serves as an assistant to the experienced employee. In other cases training is conducted along a promotion ladder; prerequisite skills are learned for the more complex skills required on the jobs higher up the ladder. At other times, workers observe their neighbors and, by practicing on the equipment during lunch break, learn other jobs within the department. The ability to perform in this manner is related to the length of time the employee remains in the department. Job skills are also acquired during temporary work assignments, such as the assignment of an inexperienced person during the illness or vacation of a regular employee.

Regardless of this diversity, the training patterns mentioned above have three common features: (1) training takes place on the job; (2) it occurs in the process of production; and (3) it is highly informal.

Job training is transferred orally through demonstrations and reinforced by practice and repetition. Larger firms have job descriptions, but these are used in wage administration, recruitment and screening. There were very few instructional manuals found, and, even then, they were used as maintenance guides by those already trained. Basically, job training existed only through the process of a new hiree working with an incumbent serving as a teacher.

From this description, it is evident that the training methods used at that time were more or less non-directive. Assuming that industries will acquire a new breed of training directors who will use the systems approach and federal support to provide better methods of training, a degree of improvement should be implemented. A survey conducted by Stahl (1960) on "The Scope, Organization and Principles of Vocational-Technical Training in Industry" gives the following pertinent results:

1) Very little in-plant training was offered for executives, managers or engineers. The greatest amount of training was provided semiskilled workers, supervisors, foremen and leadmen, in the order named.
2) The greatest training concern was with job-orientation training.
3) The responsibility of selecting and supervising the instructors was given to a foreman twice as often as to any other person.
4) The most fundamental requirement for an efficient and successful in-plant training program was the existence of a sufficient number of interested and eligible learners for a class-size group.
5) Training in industry should try to develop wholesome worker attitudes and appreciation or loyalty and honesty. (The study did not identify any specific methods which were used by industries in the Greater Louisville area to carry out their training program.)

A more recent survey conducted by Utgaard and Davis (1970) examined the training techniques most frequently used by 112 firms in the Twin Cities of Minneapolis and St. Paul (See Tables 1 and 2). Results found in Table 1 indicate that job instruction, training conferences or discussions, apprenticeship training and job rotation were the top four training techniques used by manufacturing firms. It was found that in non-manufacturing firms their top four training techniques were job instruction training, conference or discussion, job rotation and special study. Junior board, vestibule training, laboratory training and television were the four least used techniques by either type of firm.

In Table 2 a difference was found in most frequently used training techniques, as determined by net revenue, number employed and age of firm. Determination of the training techniques which were significant for each category is noted in the information at the bottom of the table. The Utgaard-Davis study pointed out that the larger firm, the larger its number of employees, and the older it was, the more frequently it tended to use the techniques found in Tables 1 and 2.

TABLE 1

RANK ORDER OF FREQUENCY OF USE OF 18 TRAINING TECHNIQUES, BY TYPE OF FIRM

Training Technique	Type of Firm			
	Manufacturing [a]		Non-manufacturing[b]	
	Rank order	Mean value[c]	Rank order	Mean value[c]
1. Job instruction training	1	3.9	1	4.0
2. Conference or discussion	2	3.5	2	3.4
3. Apprentice training	3	3.1	6.5	2.5
4. Job rotation	4	2.8	3	2.8
5. Coaching	5	2.6	6.5	2.5
6. Lecture	6	2.4	5	2.6
7. Special study	7	2.3	4	2.7
8. Case study	8	2.1	10	2.2
9. Films	9	2.0	8.5	2.4
10. Programmed instruction	10	1.9	8.5	2.4
11. Internships and assistantships	11	1.8	11	2.0
12. Simulation	12	1.7	12	1.9
13. Programmed group exercises	13.5	1.6	16.5	1.3
14. Role playing	13.5	1.6	13	1.6
15. Laboratory training	15	1.5	16.5	1.3
16. Television	16	1.4	14.5	1.4
17. Vestibule training	17	1.2	14.5	1.4
18. Junior board	18	1.1	18	1.1

[a] Consists of 63 firms.

[b] Consists of 14 transportation, 13 finance, 10 retail, and 12 "other" firms.

[c] Computed from the following values: 5 = Always; 4 = Usually; 3 = Average; 2 = Seldom; 1 = Never.

(Adopted from Utgaard and Davis, 1970)

TABLE 2

SIGNIFICANT FIRM CHARACTERISTICS RELATED TO FREQUENCY OF USE OF TRAINING TECHNIQUES, BY TYPE OF FIRM

Firm characteristic	Training Technique	Type of Firm	
		Manufacturing[a]	Non-manufacturing[b]
		Chi square (df =1)	
A. Net revenue	1. Coaching	4.21*	-------
	2. Lecture	5.42*	-------
	3. Films	5.98*	4.38*
	4. Simulation	--------	4.27*
	5. Programmed instruction	--------	4.58*
	6. Role playing	4.07*	-------
	7. Television	-------	6.13*
B. Number employed	1. Lecture	13.88**	-------
	2. Special study	6.38**	-------
	3. Case study	9.47**	4.18*
	4. Films	11.78**	5.22*
	5. Programmed instruction	--------	6.11*
	6. Internships and assistantships	--------	8.79**
	7. Simulation	11.79**	10.56**
	8. Programmed group exercises	-------	4.44*
	9. Role playing	11.29**	7.65**
	10. Television	12.15**	8.67**
	11. Vestibule training	5.85*	5.59*
C. Age of Firm	1. Conference or discussion	4.10*	-------
	2. Apprenticeship training	4.39*	-------
	3. Coaching	------	4.62*
	4. Case Study	7.21*	-------
	5. Internships and assistantships	5.26*	-------
	6. Simulation	5.15*	-------
	7. Programmed group exercises	6.71**	-------
	8. Role playing	9.68**	5.11*
	9. Television	5.83*	------

[a] 63 firms.

[b] 14 transportation, 13 finance, 10 retail, and 12 "other" firms.

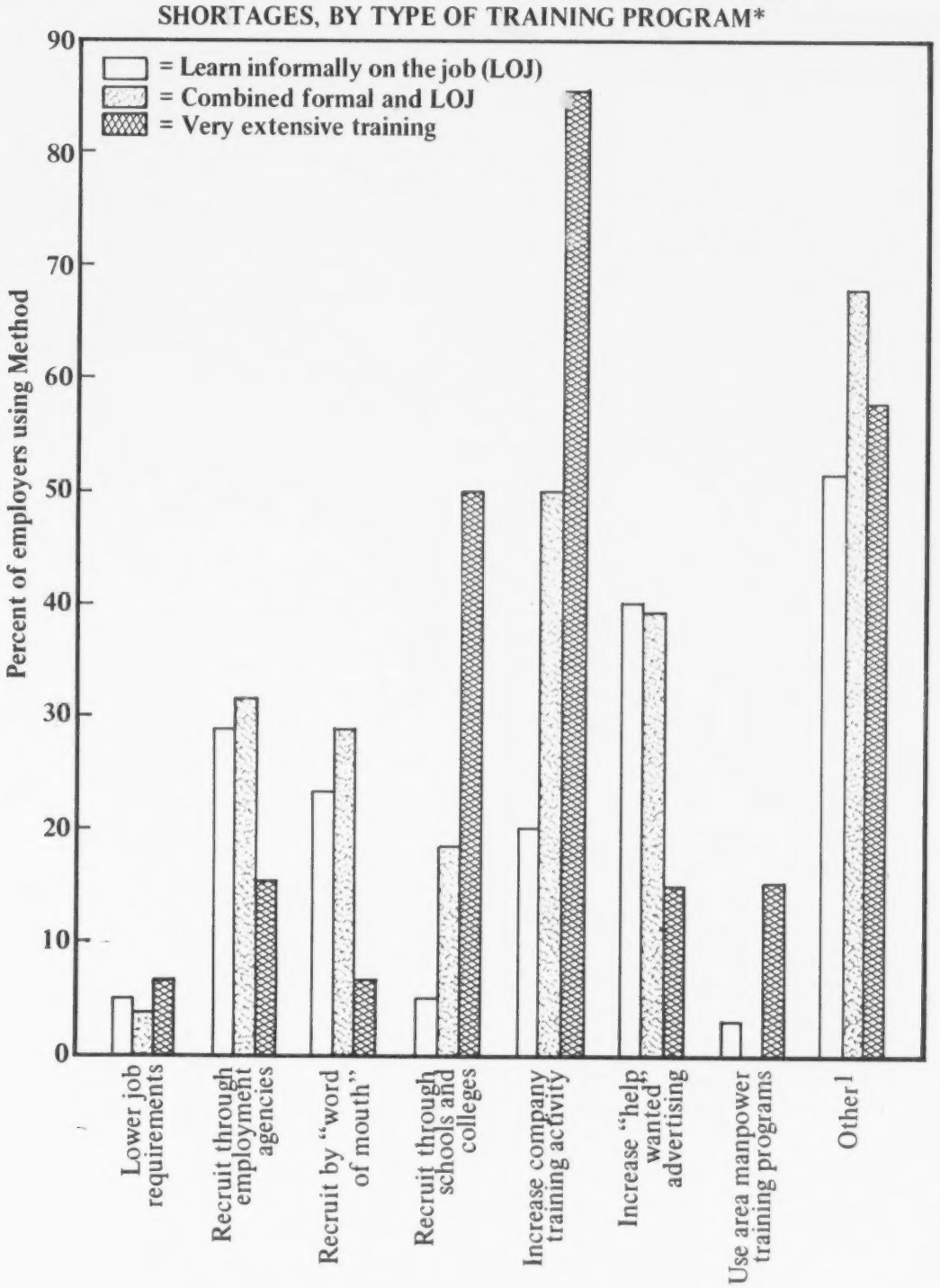
* Probability of observing the difference in frequency of use reported by the two groups of firms (of the same type), if there were truly no difference in the population of firms, is .05 or lower.

** Probability of the difference is .01 or lower.

(Adopted from Utgaard and Davis, 1970)

TABLE 3

EMPLOYERS' APPROACHES TO OVERCOMING SKILL SHORTAGES, BY TYPE OF TRAINING PROGRAM*



* For Specifics See Table 4

(Adopted from U.S. Department of Labor, Manpower Administration, Manpower Research Monograph No. 22, 1971).

TABLE 4
RANKING OF METHODS OF OVERCOMING SKILL SHORTAGES, BY TYPE OF EMPLOYER TRAINING PROGRAM

No.	Method	70 Employers with informal LOJ Training					28 Employers with Combined Formal LOJ Training					14 Employers with Extensive Training				
		Total number in all ranks[1]	Percent[2]				Total number in all ranks[1]	Percent[2]				Total number in all ranks[1]	Percent[2]			
			In all ranks	Ranked precedence of action				In all ranks	Ranked precedence of action				In all ranks	Ranked precedence of action		
				First	Sec.	Third			First	Sec.	Third			First	Sec.	Third
1.	Lower job requirements	4	5.7	4.3	1.4	-----	1	3.6	----	----	3.6	1	7.1	----	----	7.1
2.	Actively recruit through employment agencies	20	28.6	7.1	14.3	7.1	9	32.1	10.7	7.1	14.3	2	14.3	----	14.3	----
3.	Actively recruit by "word of mouth"	16	22.9	2.9	12.9	7.1	8	28.6	7.1	7.1	14.3	1	7.1	----	7.1	----
4.	Actively recruit through high schools, colleges, or private schools	4	5.7	4.3	1.4	----	5	17.9	3.6	7.1	7.1	7	50.0	14.3	28.6	7.1
5.	Increase company training activity	14	20.0	14.3	4.3	1.4	14	50.0	28.6	10.7	10.7	12	85.7	64.3	14.3	7.1
6.	Increase "help wanted" advertising	28	40.0	27.1	5.7	7.1	11	39.3	17.9	10.7	10.7	2	14.3	----	14.3	----
7.	Use area manpower training programs	2	2.9	1.4	----	1.4	0	----	----	----	----	2	14.3	----	7.1	7.1
8.	Contact Ohio Bureau of Employment Security	4	5.7	2.9	1.4	1.4	3	10.7	----	7.1	3.6	1	7.1	----	7.1	----
9.	Work overtime	8	11.4	7.1	1.4	2.9	3	10.7	3.6	3.6	3.6	2	14.3	14.3	----	----
10.	Display sign outside for walk-ins	4	5.7	1.4	4.3	----	1	3.6	3.6	----	----	0	----	----	----	----
11.	Increase hours of supervisors without extra pay	3	4.3	2.9	1.4	----	1	3.6	3.6	----	----	0	----	----	----	----
12.	Make deliberate decrease in business	1	1.4	1.4	----	----	1	3.6	3.6	----	----	1	7.1	----	7.1	----
13.	Increase pay scale	2	2.9	2.9	----	----	2	7.1	7.1	----	----	0	----	----	----	----

14.	Use or apply for government or civil service register	1	1.4	1.4	----	----	2	7.1	3.6	3.6	----	1	7.1	7.1	----	----
15.	Pirate or recruit from other employers	2	2.9	1.4	1.4	----	1	3.6	----	----	3.6	1	7.1	----	----	7.1
16.	Support private education for employees	2	2.9	1.4	----	1.4	1	3.6	----	3.6	----	0	----	----	----	----
17.	Use own agency, State training center graduates, intracompany, or contact union	2	2.9	2.9	----	----	2	7.1	3.6	3.6	----	1	7.1	7.1	----	----
18.	Hire for short term, use "moonlighters" for part-time, or subcontract work	4	5.7	2.9	1.4	1.4	0	----	----	----	----	1	7.1	----	7.1	----
19.	Hire at lower level and train, hire married women, or contact Bureau of Apprenticeship and Training	1	1.4	1.4	----	----	2	7.1	3.6	----	3.6	0	----	----	----	----
20.	Install computer or redesign jobs	2	2.9	----	2.9	----	0	----	----	----	----	0	----	----	----	----

[1] Number of responses exceeds number of employers because each employer could mention and rank more than one action.

[2] Number of responses divided by number of employers in group, not total number of responses.

(Adopted from U.S. Department of Labor, Manpower Administration, Manpower Research Monograph No. 22, 1971)

Another survey that has bearing on this study was conducted in 1968 in the Greater Cleveland, Ohio area by the U. S. Department of Labor (1971). The survey centered on the persistent questions of federally supported manpower training programs. Part of this survey dealt with the job training procedures private industry used to overcome skill shortages. A summary of this part of the survey is given in Tables 3 and 4. The summary and conclusions read:

1) Most firms are prepared to train workers.
2) Most firms are willing to allow the trainee to make mistakes while he practices his skill.
3) The typical company training method followed by most firms was not one of on-the-job training but rather "as-you-work training." This expression denotes the practice that, when an opening for a job requiring some skill arises, the worker selected moves to the assignment and takes his place in the production sequence.
4) It appears that industrial training, according to the study, is not organized in a formal and continuing program but a type of training only to meet spot needs or emergency developments.
5) Some firms provide training as a fringe benefit to workers. These programs are of a motivating nature and usually more formal.
6) A final type of program was classified as a basic education in mathematics, reading, etc. This type of training was conducted outside the regular working hours so that production would not be affected. It was normally a formal, rather than an informal, type of training.
7) The number of hours for training varied with the worker's ability to gain the desired skill standard.

The final survey entitled, "Climbing the Job Ladder," was conducted by E. F. Shelley and Company under a grant from the Ford Foundation *(Bi-Weekly Manpower Report of MIS,* March 11, 1970). It reflects the concern and problems of upgrading through retraining. The retraining process is a three-or-four-time occurrence during the lifetime of most industrial workers. It is also a factor in improving or upgrading workers who may be in a dead-end type job. This study assessed 11 industries which covered the range of informal on-the-job training to extensive upgrading apprenticeship programs to develop higher skills (see Table 5).

To summarize these surveys, one could conclude about the methods of accomplishing the job training in the process of upgrading of semiskilled and skilled workers:

1) Training for semiskilled and skilled workers is mostly an informal process.
2) This training mostly occurs on the production line with instruction given by the foreman, supervisor, or another worker.
3) The most frequently used technique or method for job training is job-instruction training that takes place on the production line.
4) Some training programs are designed to raise the workers' basic educational level through formal classroom instruction.

5) Several of these surveys are now outdated, which may indicate that collected information may not reflect present innovative job training methods.

6) Mostly informal, on-the-job training techniques are the basic method of upgrading instruction. However, in several high risk industries such as air transportaion and banking formal training is common.

Case Studies of Selected Industries

The second type of information reviewed on methods used in job training is case studies of selected industries. These case studies came mostly from the *Bi-Weekly Manpower Report of MIS* (1969--), published by The Bureau of National Affairs. The first case study reviews the emphasis on human problems found in Chrysler's training efforts (*Bi-Weekly Manpower Report of MIS,* November 18, 1970).

For the disadvantaged trainee, Chrysler shifted its content emphasis from the mechanics of the job to human factors of production work. On-the-job training was not enough. Therefore, Chrysler officials sought ways to teach motivation, discipline, and teamwork on an eight-hour work day schedule while tackling trainees' personal problems.

The best method of training was the vestibule approach, that is, a simulated work situation located close to classrooms where trainees could divide their time between actual practice and discussion of job-related problems. Within six weeks the trainees were better equipped technically to move on to the assembly line, having greater insights into interpersonal and group relations.

The staff members, white and black, were specifically oriented toward both the knowledge aspects of the job as well as the ability to identify with the hardcore trainees. A special counselor helped the trainees solve their personal problems. Another advisor counseled the trainees' motor-skills development. Once each trainee was placed in on-the-job training support continued through a follow-up advisor. This was considered a very important factor to ensure early success by the trainee. The sensitivity of the entire staff to the trainee problems and pressures was a vital factor to the program's success.

The second case study involved AT&T's "Training/Upgrading Plan-Maker Use of Systems Approach" *(Bi-Weekly Manpower Report of MIS.* October 21, 1970). AT&T, because of its efforts to train 260,000 plant department draftsmen, established a training and upgrading procedure using the systems approach. The goal of the AT&T was to establish a training program where many factors would be standardized, from the abilities of trainees entering at a given level to the way in which skills are applied upon completion of the program. This method of training was based on eight basic elements. The eight elements provided the ways and means of consistently updating the training programs to meet new skill demands. To satisfy the training requirements within the eight basic elements, training packages were developed at AT&T through the analysis of career paths of company employees.

TABLE 5

STUDY OF UPGRADING PROCEDURES IN ELEVEN MAJOR INDUSTRIES

Editor's Note: The following table, from the study, *Climbing the Job Ladder,* shows the upgrading procedures and manpower activities and attitudes in 11 selected industries.

INDUSTRY	USUAL SELECTION METHODS	USUAL TYPE OF TRAINING PROVIDED
MOTOR VEHICLES	Posting and bidding is normal, but varies depending on local agreement. Seniority is primary determinant. Apprentices selected on basis of written test and worker background.	Informal OJT conducted during working hours most often by foreman or first line supervisor. Apprentice training combination of classroom and formal OJT handled by company training department.
BASIC STEEL	Posting and bidding is normal. Departmental seniority is primary determinant except at the highest level. Apprentice openings posted and tests given for selection.	Informal OJT conducted during working hours by co-workers and foreman. Apprentice training is combination of classroom and formal OJT. Some effort to upgrade skills of craftsmen through classroom training after hours.
RUBBER TIRES	Posting and bidding with departmental seniority primary basis for selection.	Informal OJT conducted during working hours by foreman, first line supervisors and co-workers except for apprentices who are handled as in auto and steel.
APPAREL	No industry-wide pattern discernible. Cutters often upgraded on basis of seniority in large shops. No real upward progression for finishers or sewers.	Informal OJT during working hours. Some formal OJT in larger shops while workers learn new processes.
PRINTING	Selection of apprentices based upon formal testing and ability first and seniority second.	In union shops, generally a combination of OJT, classroom and correspondence courses often in off-site centers or in local public or private schools. In non-union, OJT is prevalent.
AIR TRANS-PORTATION	For union workers seniority by geographical location is primary. For non-union workers ability, measured by supervisor's evaluation is most common.	Flight service personnel receive extensive classroom training. Most maintenance and ramp service workers and agents trained through combination of formal off-line orientation and OJT. Classroom training conducted in special facility by company training staff. OJT by first line supervisor or foreman.
TELE-PHONE	Seniority is predominant but weight of ability varies from company to company. Posting	Formal classroom training is a prime component of employee development program both for

	and bidding is common selection mechanism.	entry-level and subsequent training. Training is conducted in special facilities by company's central training department. This is supported by OJT conducted by first line supervisor under guidance of training department.
DEPARTMENT AND VARIETY STORES	Ability measured by supervisor's evaluation is primary, with seniority second.	Little formal training beyond the initial orientation period carried out by training department in special classroom sessions.
COM-MERCIAL BANKING	Ability measured by supervisor's evaluation is primary. Seniority is important in moves through lower levels. Selection decisions handled by central personnel office.	Formal classroom used for initial teller training generally carried on by the bank's training department in special facility. Most subsequent training for all occupations is OJT combined wth vocational enrichment programs through the American Institute of Banking (AIB) and tuition remission. OJT is handled by first line supervisor. AIB instruction is voluntary, after hours.
INSURANCE CARRIERS	Ability measured by supervisor's evaluation is primary. Seniority is important in the moves through the lower levels. Selection generally made by the department head.	Primarily OJT with the exception of certain skills such as correspondence or EDP training carried on by company's training department. Industry provides extensive vocational enrichment through industry associations and tuition remission.
HOTELS AND MOTELS	Ability measured by supervisor's evaluation.	Almost exclusively OJT, conducted by first line supervisor.

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The eight elements were:

1) A known entry level for employees. Bell had a standard entry level where most employees started. The hardcore were given compensatory training until they reached the standardized level. Each step up the career ladder had a standard attainment level.

2) Foreman training on employee development: Bell entrusted each foreman with the development of a training plan for the craftsmen he supervised. The foreman diagnosed the trainee and prescribed specific training methods, especially for the classroom work.

3) Classroom training plans. AT&T had 139 standardized training courses with instructional material, text material, instructors' guides, exercises geared to specific job requirements and test recommendations.

4) On-the-job training programs. The worker's foreman conducted on-the-job training. During this training period the trainee also used a self-instructional training package.

5) Foreman development. Since AT&T thought that the foreman was a key member of management, he was given training in four areas: (a) orientation for new foremen, (b) management development, (c) how to analyze the job situation and plan improved operations, and (d) technical development.

6) Opportunity for self development. This provided the opportunity to use correspondence courses as well as supplying tuition aid to all employees.

7) Continuous planning for new courses. As new equipment was completed so the training of employees was carried on. This provided the ideal situation, because without training, equipment could not be installed nor serviced properly.

8) Evaluation plans. AT&T evaluated its training program from beginning to end. It looked at all items which may have had an influence upon training methods.

AT&T officials believe that the systems approach has provided a comprehensive plan not only encompassing the building blocks of training, but also meeting the constantly evolving needs of a company.

The third case study considered Republic Steel's "Keys Training to Development Future Manpower" (*Bi-Weekly Manpower Report of MIS,* June 9, 1971). Republic Education Institute (REI) developed a training program for the disadvantaged at five of its plants, Buffalo, Chicago, Cleveland, Youngstown, and Niles, Ohio. The program began in 1968 to offer training for jobs in the steel division, manufacturing or warehouse division and union drain division. The training methodology was the same for all the participating plants.

The first phase methods stressed orientation training. The content included safety, employee benefits, employee-employer obligation and human-relations training.

The next phase of the program provided training with basic or remedial education. During this phase the trainees alternated with actual work stiuations, on a route of two days classroom training followed by three days on the job. Each trainee was given individual help throughout his development.

While in school all trainees participated in group counseling sessions which helped them to develop their own effective goal-setting levels for career planning. The counseling sessions were reported to provide the best method of helping trainees cope with their personal problems. Also legal assistance was provided, when needed, during the counseling sessions.

The training programs extended to the actual job situation where the plant personnel at the production level gave on-the-job training. Supervisors who trained the new trainees were given awareness training to help them cope with the disadvantaged new hirees. Using on-the-job training, the new trainee was paired with an established employee. This technique was called the "buddy system." Often this experienced employee buddy had started as a disadvantaged worker himself. This enabled the newly hired employee and his buddy to better identify with each other.

The manpower program of the National Alliance of Businessmen (NAB) placed the major responsibility for training the hardcore in the hands of

American industry. According to Peterson and Rash (1969), the key to success or failure of the NAB program lies in the attitude of first-line supervisors. Training programs were initiated for first-line supervision and an array of formal training sessions were held.

Peterson and Rash discussed several NAB training case studies two of which are described below:

Case History – Secretarial

Pittsburgh Plate Glass hired 17 black female high school graduates as secretaries. Part of NAB's program was to give the girls a master training program in language, mathematics, public speaking and business procedures. A professional counselor provided weekly individual and group counseling sessions where each trainee's performance was reviewed. The course lasted 10 weeks and all participants successfully completed the course and were retained for employment.

Case History – Metalworking and Woodworking

The General Dynamics Company hired 200 hardcore jobless in a San Antonio plant to fabricate wood and metal items. Of those 200, 110 remained and they are the entire staff of the San Antonio plant. The quality of products as compared to similar production at other plants is superior because of lower rejection rates. The success of this program is attributed to special training. This training involved several weeks of preconditioning before trainees entered regular jobs. The training content included basic education in mathematics, reading, and language as well as supportive services in health, counseling, testing, guidance and personalized help.

The final case study is about the findings of an ad hoc National Advisory Committee on training complexes. One of these studies was performed by DeVore (1970:1-3) at Sears and Roebuck's Northeastern United States Territorial Training Center. DeVore's report listed the following:

1. The formal objectives of the training program were to provide:
   a) Basic training for the inexperienced
   b) Cross-training for the experienced
   c) Advanced training for the specialists

   In all cases, the prime objective was to enable the individual to perform satisfactorily in his assigned task.
2. Training emphasized:
   a) Appliance service
   b) Electronics
   c) Automotive repair
3. Training materials were developed using:
   a) Technical information developed by source manufacturers and center instructors
   b) Instructional tactics, procedures, and media developed by center instructors

4. The trainers were picked from the territorial field engineering staff or from the field service supervisors. Selection was made on their technical background, ability to communicate, deportment, and sincere desire to be of assistance to others lacking in knowledge. They were trained by periodic visits to various manufacturers who provided their training and engineering staffs to impart information on current and future technological changes. Also, audiovisual suppliers provided their instructors periodically to introduce new methods of communication.

5. Trainer evaluation consisted of:
   a) Comparison of the results of the pre-training test with the results of course tests
   b) Students' ability to perform in the laboratory sessions
   c) General comments received from students

6. Trainees:
   a) Trainees were company service employees numbering some 4,000 men in the northeast, all of whom were eligible to be enrolled in any of the 30-odd courses which Sears conducted.
   b) Training periods were from one to two weeks in duration with time lapses of two to three months between sessions, during which time the trainee returned to his service unit and put to practice those things he had been trained to do. The trainee was encouraged to participate in related correspondence courses, which were provided at no charge. (At present, there are approximately 5,600 active students involved in home study courses.)

7. Evaluation of training:
   a) Evaluation was done on a local level by local unit management
   b) The most adequate training experiences were those provided in the laboratories and work areas. The least adequate were those involving theory lectures. Training programs generally provide a significant boost in employee morale.

8. Cost: The training program cost $170,000 annually. This did not include student salaries and travel/living expenses.

These case studies give a brief account of what methods specific industries are presently using to train and upgrade various types of workers. It appears from these case studies, that both formal and informal training methods are being incorporated to do more than train a worker for one skill, in that they also provide him job satisfaction.

Information on Methods from Other Selected Literature

The third and final report on training methods deals with other selected literature not covered in the prior two information areas. One such training method is called High Intensity Training (HIT). The *Bi-Weekly Manpower Report of MIS* (June 9, 1971) indicated that HIT is a versatile tool of organizational intervention which can be used in several different ways to

alleviate employment related problems. Examples include skill training, human relations, job restructuring, communication, individual remediation, resolving organizational conflict and employee conflict. In essence, the HIT method of training is an intensive high impact technique used for training low-skill workers. The skill upgrading project in Cleveland in 1970 found only positive results in the use of the HIT methods because it was done in the plant where a relevant, specific job was used to motivate the trainee.

One of the recent trends in industry as well as education is the use of objectives to guide and direct the training and/or instructional process. *Training by Objectives* by Odiorne (1970), a book that adequately described this process for industry, won the American Society of Training and Development's "Article of the Year" award for its first two chapters.

The method of training by objectives fits well into the systems approach to training development of the industrial workers. Through the analysis of the training evironment and the identification of specific behavioral objectives, the proper mix of job-training methods can be applied and systematically assessed. Through this procedure industry eventually will become knowledgeable about which training methods seem to work best with various trainee types under different job situations. This process calls for the use of new evaluation strategies and tactics. Rose (1968), Buehler (1969), Kayloe (1971), Prather (1970) and Mahoney (1969) gave examples of industry-tested evaluation strategies and tactics which are needed for improving job training.

Perhaps the best specific method to use in training industrial employees at this time may be the use of electronics hardware and materials such as video tape, transparencies, films, records, teaching machines, and other marvels of instructional technology. Eitington(1970:10) believed, however, that the use of up-to-date audiovisual methods is fine where appropriate but they are basically a one-way means of communication. He went on to state:

> I would opt for trainee-involving methodologies such as buzz groups, role playing, dyads, triads, in-the-basket exercises, games, the laboratory method, etc. and wages that are adequate, and respectable end results would ensue with a minimum of paraphernalia.

This idea fits the feeling that the new breed of workers want to be recognized and appreciated as human beings rather than treated as mechanical robots.

Facilities

Facilities are those spaces, pieces of equipment and materials used in support of job training. The facilities used in job training in industry were not determined entirely through the review of literature. Some industries strictly use the production line as the sole training facility. Other industries use the classroom, plus a vestibule training facility (a simulation of the production line) to give on-the-job training. Still other industries use a combination of public institutions' facilities which are congruent with the content and methods of training. When training specific types of trainees (e.g., older adults, racial minorities, the hardcore, women or the handicapped), the physical factors are

extremely important to training. Goulette (1970) explained the physical factors to consider when training adults. These factors include ways to facilitate the older adults' sight, hearing, dexterity, grip and general health. Murphy (1969) described the proper training space and equipment for training of minority groups:

> Classes are held in an unused meeting room in a power station. This is the off-the-beaten path, quiet, and with ample facilities and and accommodations. Tables and chairs set at angles help create an atmosphere of informality and encourage participation. Visual aids, such as blackboards, charts, movie projectors, and tape recorders are employed by the instructor (p. 11).

Another example of the type of training faiclities for a specific industry is the one developed for pre-employment secretarial training of the disadvantaged worker. Stein (1971) specified this type of facility when he stated that one room comfortably housed a desk for each woman, an electric typewriter and an audograph. A former conference room was converted into a general studies classroom. Also, six smaller rooms were provided for private counseling, plus an office for each staff member. The general impression left by the author was that the physical setting had much to do with the success of the program.

Many of the larger industrial corporations have set up sophisticated lecture and laboratory facilities for job training. These larger industrial firms also have elaborate training equipment, such as programmed instruction, media materials and equipment, training-material reproduction capabilities, mock-ups, training boards and simulators. Specific companies which have such facilities are General Motors, Bell Telephone of Detroit, Hobart and Lincoln Welding, Delco Remy, Caterpillar Tractor, Ford Motor Company, Champion Spark Plug Company, Vickers Hydraulic and many more large firms.

Of course, these types of facilities are not found on the production line where most workers receive their training. By the same token, better facilities for trainee study and appropriate reading material perhaps could augment the success of a production-line training facility.

Cost

Cost is defined as the money used to provide facilities, maintenance and personnel for the job training program. According to Perlman (1969:47) in his survey of Milwaukee manufacturers, almost none of the respondents could offer approximate estimates of costs. He further noted that the explanation for the lack of data or cost is due to the fact that insufficient records are kept and the absence of precise estimates of the time foremen spend training new workers. Also, if the new trainee does not perform according to the job standard, the reflection of cost is now shown, since his rate of pay is relatively low because of his recent hiring. The U.S. Department of Labor report (1968a:40) states, "The lack of comprehensive data on employer expenditures of training is one of the most significant gaps in information on training in industry."

The Task Force did review costs found in small scale surveys, and made the following rough conclusions:

1) There is considerable variation in training cost among industries. The fabrication industry spends over $1000 per worker trained, while firms in the electrical machinery industry spend less than $270 per trainee.

2) Cost differential is reflected mainly in the expense of training personnel. If the trainee is a highly skilled craftsman, the cost is high and vice versa if he is less skilled.

3) Wages paid to new hirees are not offset by their production performance.

Because of the financial support accorded manpower development today, the government is concerned about the cost of all federally supported programs.

In the U.S. Departmentof Labor report (1968b) a comparative cost of vocational education, Manpower Development Training (MDTA), and On-the-Job Training (OJT) is depicted in Table 6.

TABLE 6
APPROXIMATE TRAINING COST

Type of Training	For Persons Employed in	
	Training, related jobs	Any job
Vocational Education, 1965	$3000	$2000
MDTA, FY 1967		
Institutional	4350	3620
Institutional (excluding allowance)	1950	1625
OJT	495	490

It has been shown by the U.S. Bureau of Labor Statistics that vocational education enrolls nearly 90 percent of all civilians who receive federal help in job training. It appears from this figure that industry can train workers at much less cost than can vocational education. These figures are rather deceptive because they fail to consider the total lifetime effects of a formal vocational education program as compared to the very specific, informal, short-term job training found in industry.

THE SYNTHESIS OF SELECTED JOB TRAINING PROGRAMS IN INDUSTRY

This section contains a synthesis of the literature reviewed in previous sections. To accomplish this task logically, the following major categories will be used:

1) Strengths and weaknesses of job training
2) Linkages between vocational education and job training in industry
3) Job training needs in industry
4) Needed research by industry on job training for industry
5) Current trends in job training.

Hopefully, through the examination of these major topics, a valuable insight can be gained for improving vocational and technical education.

Strengths and Weaknesses of Job Training

The determination of both the strengths and weaknesses of job training in industry is important. By understanding which type of job training industry does best and which public school vocational and technical education does best, vocational and technical education stands to gain much in planning its future training programs.

Strengths of Job Training

When job training is provided at the work site, several instructional benefits occur. For example, Mangum (1968) stated that the workplace has the advantage of realism--the atmosphere and the discipline which is difficult to duplicate in a contrived environment.

Mangum further stated that job training in industry would save not only on the duplication of expensive training equipment, but also through use of skilled employees and supervisors as instructors. In some instances, on-site facilities cannot be duplicated or contrived, in a training institution, such as a coal mine.

Another strength of job training is learning benefits. For example, length of training is not limited to a set class-period of weeks, months, semesters or years. This helps the slower learner gain confidence through repeated production-line experiences. Because the learning experience is mostly informal, it provides one of the best means of training the disadvantaged, the hardcore, the mentally retarded, the unemployed and the underemployed. Mangum (1968:14) supported the above claim for the disadvantaged with the following:

> for those whose competitive handicap is a lack of basic education, institutional training ordinarily provides the most efficient means of

> supplying it. . . . However, many may have had such unfavorable experience with the public schools, may be alienated from public institutions, or may lack the patience and foresight to pursue an education and training courses leading to employment. For them, it may be necessary to bring the education and the training to the workplace.

It was reported in *Bi-Weekly Manpower Report of MIS* (March 25, 1970) from the research survey conducted by Mueller, et al. (1969), that ". . .on-the-job industry training is the most effective manpower program." Since the manpower programs were designed to help hardcore, unemployables, disadvantaged and the underemployed it follows that job training in industry can provide learning benefits which are better for certain groups of workers than institutional-type training. In contrast to this, Malcolm Lovell (1971), Assistant Secretary of Labor, in a speech at Kansas City, Missouri, stated that the best type of manpower training occurs when both industry and educational institutions form a partnership training program. He did state, however, that it is the employers instead of the schools who are carrying the largest burden for vocational training of manpower students.

One other strength of job training is in cost-benefit factors. Lebergott (1968:18) stated:

> Most American workers . . . learn the skills required for their jobs at the worksite. . . . The $10,000 spent by the on-the-job training programs help reemploy almost six times as many workers as when spent for institutional training.

As a result of this data job training in industry could provide a greater rate of economic growth and progressively fuller use of human resources.

A worker who is being trained while employed may not be on welfare which can provide both economic and social betterment for the trained as well as all Americans. In reality, industry is not only in the business of providing goods and services but also specific job training for the worker. In some cases, the products and services produced during the training process can be sold by the company, perhaps a means of reducing training cost.

Weaknessess of Job Training

A major weakness of job training is in the area of instruction. The first problem is cost. According to Mangum (1968) only the larger firms are financially able to provide a training director, hire instructors and develop a planned curriculum. When an employer invests in a machine, naturally, he owns the machine. However, when an employer, large or small, invests in employee training, he has no guarantee that he will realize the full benefit from the original training expense. Nevertheless, Mangum noted, an employer in a large firm has a much greater chance in gaining full return for his investment because of the size of the labor market. Generally, larger firms usually pay better, have greater welfare benefits and job security. Another cost factor is that normal job-training programs are not designed for large group instruction but for a one-to-one ratio. Finally, to train employees on expensive and sophisticated machinery which could be damaged, might, in the long run, cancel any training cost-saving benefits.

A second problem is in instructional methods. If the job requires greater theoretical knowledge than manipulative, the normal job training may be inadequate.

> The school may make it easier to combine theoretical knowledge and manipulative skills, though this is not ruled out in the workplace. It may be possible also to supply skills in a shorter time by contriving sequences at the instructor's discretion, adjusting training to the trainee's learning pace and concentrating on and reiterating difficult areas of learning. (Mangum, 1968:8)

Evans (1971) stated that industries in this country which lack a definite program of job rotation for activities requisite for skill development rely on OJT to train their workers. He further stated that OJT does not provide both formal education in theory and practice of the specific occupation.

Because of the rapid advances in technology there is a gap developing between low-skill and higher-skill jobs. This dilemma has caused difficulty in upgrading workers through normal job training procedures.

> a chasm between low and higher skill jobs, is becoming increasingly difficult for an individual worker to bridge through traditional, on-the-job training techniques. (*Bi-Weekly Manpower Report of MIS*, March 11, 1970:10)

Even with federal support and recent societal demands there has been no real surge of employer efforts to develop in-house training programs to improve new hirees' efficiency and upgrade present employees. Lack of change in employers' posture towards improving new hirees' efficiency and employee upgrading is due to problems of changing worker behavior traits, such as promptness, regular attendance and temperament. Some observers of job training feel this posture of employers could also be due to the assumption that training is usually initiated as a by-product of industry, is unstructured rather than planned, and is reduced as the profits drop.

One great job training problem in industry is that it is normally designed for immediate job performance, instead of for career-type positions which provide vertical and horizontal mobility to the worker. Due to this type of job training, some indicate that one-half of the factory workers hired at any time will not remain on the payroll for over one year because of poor industrial training policies and techniques. Concerning Chrysler Corporation's training efforts:

> The revolution – or evolution – at Chrysler is seen in the shift in corporate manpower policy from emphasis on the mechanics of the job to the human factors of production work. (*Bi-Weekly Manpower Report of MIS*, November 18, 1970:111)

A synthesis of the most recent job-training literature indicates that it takes more money today than skill training to produce an effective and productive worker.

Develop Linkages Between Industry and Education

There is an attempt in this section to identify what dissatisfactions industry has with vocational education, what problems industry has in

cooperating with vocational education, and ways and means of building cooperative linkages between vocational and technical education and industry. It must be pointed out that the references are not from all levels of industrial workers, but from those of management, university professors, training and development directors and manpower reporters. Therefore, this information may not appear to be totally objective.

Vocational and Technical Education's Problems of Building Linkages

The determination of the best ways and means of building better cooperative linkages between industry and vocational technical education requires the identification of training inadequacies felt by industry. According to the National Association of Manufacturers (NAM) report (1970) on secondary vocational education the overall effectiveness of vocational education programs is less than satisfactory because they do not adequately prepare sutdents for the occupational training needs of industry's manpower requirements. As was reported in a survey conducted by Mueller, *et al.* (1969), industry claims, at the present time, that neither a vocationally-nor nonvocationally-trained employee is any more proficient in learning a specific job skill.

In an extensive survey conducted by Perlman (1969) of Milwaukee manufacturing firms which train semiskilled and skilled workers, most firms reported that vocational education for particular jobs provided inadequate preparation for related company positions, and that the time required for training was not significantly less for workers who had gone through a vocational course than for workers promoted without prior preparation for the new job.

Perlman (1969) determined that the reason for the negative attitude which firms have towards vocational school efforts is primarily based on the training of students for a specific company job. That is, vocational schools cannot successfully train students even for one occupation or for one company because the training requirements may not be parallel for the same occupation in another company. NAM (1970) in its report of secondary vocational education agreed with Perlman when its findings indicated a common complaint of vocational school education by industry is that vocational education continues to train students for specific jobs within a broad occupation which are no longer needed.

There are other complaints about vocational education programs which need to be identified. In a study of technology's effect on the labor force in general Mueller, *et al.* (1969) found that workers with only a vocational education frequently failed to adjust to technological changes. This, they stated was either due to the rigors of automation, which may demand certain intellectual skills provided only in a more formal educational setting, or because vocational courses may be inadequate in providing needed competencies through unevenness in quality. Burt (1969) and NAM (1970) in its secondary vocational education report both noted that vocational education is experiencing problems because (1) vocational education is still reaching too few students; (2) vocational educators are hesitant about inviting industry to become actively involved for fear of creating major changes; (3) there is a lack of career guidance provided by school counselors, since most of their time is spent on college placement, and they have a poor perception of vocational education as reflected in the attitudes

of parents, businessmen, and nonvocational educators and; (4) they have failed to serve the disadvantaged, hardcore or mentally handicapped.

Industry's Problems in Building Cooperative Linkages

Of course, vocational education is not totally accountable for this problem. Industry must also share its part of the responsibility for relevant training. There is a communication gap between vocational education and industry (Banta, 1970). This is evident from the statement of industry that schools do not understand the requirements of today's job market. Educators reply to accusations with this statement--how can we meet industry's needs when industry will not take the initiative and tell us what they want.

In a report on secondary vocational education the NAM (1970:9) asserted that a major external contributor of vocational education's failure to meet occupational and educational needs of students and of society "has been the limited business and industry involvement in shaping the direction and program requirements of vocational education." This report added further, that the reasons for industry's hesitation to get involved with vocational education are (1) many firms became disillusioned with vocational education programs and started their own; (2) educators did not seek nor appreciate industry's help; (3) too often, union contracts minimize the benefits of getting involved and (4) a certain number of industrial firms are not aware of the methods of getting involved with vocational education.

Perhaps one of the major problems against building cooperative linkages between vocational technical education and industry is the inability of both to provide a smooth transfer of students between school and industry. Warren (1967) of the Quester Corporation agreed with this statement when he said industry would increase its support for vocational education when schools deliver a student who is capable of functioning with not only the basics of education, such as mathematics, reading and writing, but also with broad occupational training.

Not enough is known about the transition of a high school graduate to his job (NAM, 1970). The bridge between school and work requires more of the student worker than the acquisition of technical knowledge. Lovell (1971), Assistant Secretary of Labor, asserted that the individual needs a broad foundation of appropriate societal concepts for meeting employment responsibility and making good decisions. High youth unemployment rates hamper the establishment of good worker-employability habits. That is, the type of job aspiration and the nature of the available job market are not compatible. These rates point to the assumption that this is a sharp break between whatever is done, taught and required in high school and what is required on the job. In the December, 1971 issue of *American Vocational Journal* (Rathbum, 1971a) the Department on Manpower Research Visibility (MRV) outlined several procedures on how vocational education could improve its delivery system. These procedures included (1) an awareness of apparent deficiency of useful information about manpower needs in a community, (2) initiate a planned program or system of data collection and analysis, and (3) the consistent and continuous revision of curriculum and course content. Also identified in this

department of the Journal (Rathbum, 1971b) was an Occupational Training Information System (OTIS) for statewide manpower planning from the Oklahoma State Department of Vocational and Technical Education. The system is considered an innovative scheme which is responsive to shifting labor market conditions.

How to Build Better Cooperative Linkages

What is the best solution to the problems of building better cooperative linkages between vocational and technical education and industry? Lovell (1971) suggested, "school counselors need to take a more active part providing linkages between school and work for their students." He further pointed out that to do so the counselors would need to know the job market and be known by employment service personnel, employers, trade union leaders, officials of private trade schools and administrators of government supported training programs. Vocational counselors, according to the NAM (1970) report on secondary vocational education, could also provide students information brochures developed for them about local and state job entry skills, employers, working conditions and opportunities which would help the student make the transition from school to the world of work.

What job behaviors should a vocational education student possess if he is to be a success in the world of work? At present, according to the literature in vocational training, vocational counseling, personnel selection and placement have little empirical data on what specific job-related behaviors are necessary for training and retraining. Lovell (1971) indicated three areas where the schools can have an impact on manpower development. First, education should establish the preconditions for employment success; second, specific vocational preparation should be provided; and third, an introduction to the world of work should be provided.

A U. S. Department of Labor report (1968a) determined that with a sufficiently broad and careful study, useful information could be provided to employers, schools and various community agencies to plan and develop demonstration projects on how to promote better transition between school and work. Some industrial training and development directors indicate that there should be the establishment of a placement center in the vocational schools to help students make the transfer from school to work. These centers would serve as a training and development control center to place students, make follow-up studies, and run job projection surveys.

Perlman (1969) identified some profound ideas in developing cooperation between vocational schools and industry which are:

1) Vocational schools should emphasize education and move towards becoming vocational colleges rather than training centers. This is a partnership in which vocational education provides a broadly educated student for industrial needs. The employer role is to train the student for a specific job in line with an individual company's requirements.

2) Training programs of employers will follow the apprenticeship pattern of training. This pattern is basically a learning and working

form which is carried on concurrently by both industry and vocational technical education. This separate but cooperative function should help remove the dissatisfaction of vocational education. Accordingly, vocational education will be asked less and less to provide training and practice in a specific skill and more and more to provide the general knowledge common to most jobs. It is evident that vocational education will be asked to specialize in theory and not basic skills required for a specific industrial job.

3) The worker may receive vocational training at school and practice on the job in more than one job area or occupational category. The whole question of an inadequately trained worker would not arise since the specific employer is doing his own training. In addition, the vocational school can serve as a screening device for industry for weeding out the undesirables for a specific industry.

This report leads to the conclusion that cooperative work-study programs are one of the better means of building cooperative linkages between school and work. Burt and Striner (1968) stated that the cooperative program between school and work needs to be expanded. Lovell (1971) and NAM (1970) agreed when they both indicated that high school cooperative work-study programs have more success than any other vocational education program. The U. S. Department of Labor report (1968a:91) states, "the expansion of the number of young people in cooperative work-study programs would make a significant contribution toward bridging the gap from school to work." Industrialists generally feel that vocational education's best training program is the cooperative work-study plan where both relevant occupational theory for the world of work along with up-to-date skilled training on sophisticated machines can be provided. This linkage between industry and vocational education perhaps is the key to providing relevant and realistic job training to students.

Other Significant Factors for Building Cooperative Linkages

These factors for building cooperative linkages include an array of ideas which are:

1) Marland (1971), the U. S. Commissioner of Education, is trying to promote a better collaboration between schools and industry by picking a new top team to lead an agency to accomplish better cooperation between industry and schools.

2) Burt (1969) stated that local, state and national advisory councils must, and should, coordinate their efforts to foster better industrial-education cooperation. This better cooperation between these two agencies will not just happen. To make it happen there must be a specific plan that is continuous and systematic which has necessary machinery to accomplish the task.

3) Burt and Striner (1968) suggested a plan that a local industry "adopt a school" in order to improve not only the vocational program but the total school curriculum. These employers, once they found out that they were wanted and accepted by the local school officials and students, most likely would be willing to provide professional, technical and supervisory staff to assist where they were wanted and

needed. Many ramifications of this idea could certainly build linkages between school and work for all concerned.

4) One of the best ways to promote industry-education's cooperation, states the NAM (1970) report on Industry-Education Coordinator, is to designate a qualified person at all levels of government to coordinate and enlist industry-education cooperation.

Warren (1967) told this writer that industry and vocational technical education can begin to build cooperative linkages by both sitting down together and working out the role each is to play in training American youth. Perhaps a national task force is what Warren is suggesting to move off dead center toward generating better cooperation between vocational-technical education and industry.

Rathbum (1971d:29) agreed with the above, "The importance of school-industry/business liaison cannot be overemphasized." However, he added, "Administrators, especially in community colleges and comprehensive high schools, do not recognize the absolute necessity of this function to develop proper rapport, gain realistic insight into labor market needs, and obtain mutual support." Both industry and vocational education can cooperate if they can move from conversing to communicating.

Job Training Needs of Industry

There are many determinants with which industry is concerned and which are founded basically in economics. These concerns deal with obtaining the type and number of workers who can assist them in meeting company objectives. To gain this end, industry needs useful information on the best vocational technical content, sequence, classes, teachers and programs to gain the most effective employee who stays on the job, has less absenteeism, has a cooperative attitude and one who can successfully bridge the gap between school and industry.

For industry to increase worker productivity, ways and means will need to be determined regarding how to motivate him. Perhaps the key to motivation is to develop occupational structures which will provide job enrichment through adult career reeducation. This process may reduce dead-end type jobs, which, in turn, will attract qualified young people to stay with one firm, so that the company can provide and receive job training benefits through economic gains.

A most enlightening publication by Horabin (1971) identifies several strategies and tactics of increasing employee productivity. These strategies and tactics include management by objectives, theory/management, job enlargement, reinforcement theory, contingency management and problem solving and decision-making theory. Horabin (1971: i) clarified the need for changes in the ways and means of increasing production:

> Industry and commerce are entering the phase of diminishing returns from further mechanization and automation. Once again, increase in production must be gained by improved human performance.

Realizing that worker productivity is a national concern as pointed out in "Where the Jobs Will Be in the '70's" (1971), by President Nixon, who appointed a National Commission on Productivity, which was instructed by him to study ways to increase productivity. Management and unions are also concerned with worker productivity, as are all Americans, because it is a determination of consumer cost.

As pointed out by Perlman (1969), industry wants vocational education to change its role of training workers in a specific skill to one of training for a broad knowledge of industrial needs. With this concept many industries, large and small, will need either to develop their own specific skill-training program or contract with vocational and technical education agencies. With this thought in mind, industry will need to consider the projected changes in technology and manpower needs. This workforce will require skills requiring specialized training. Most technical jobs of the future will be knowledge based and will require formal classroom training (Drucker, (1969).

It was reported by the U.S. Bureau of Labor Statistics that the requirements for service workers are expected to increase in the 1970's by 33 percent; requirements for craftsmen by 1975 will be 19 percent; requirements for operators will be 8 percent, and there will be less demand for the common laborer. Added to this dilemma for industry are the drugs and alcoholism which are requiring industry to train both supervising and training personnel as well as workers to detect and help workers to prevent serious accidents and loss of production.

With the advent of the MDTA in 1962 and societal forces, industry has need to develop effective training and retraining strategies and tactics for disadvantaged, hardcore, minority groups, older workers, physically and mentally handicapped, unemployed, underemployed, veterans and women as well as the regular workforce. If industry considers training this vast range of training and development requirements, it will need more training and development personnel.

Needed Research by Industry on Job Training for Industry

Industry has specific needs for research on the nature and scope of training, women workers, laws governing job training, projected economic and manpower needs and cost of training. Specifically, these are:

1) Studies to fill the information gap on the scope and nature of job training in industry need to be made.
2) Answers on how to develop a better system of data reporting on federally supported projects as well as industry's other training efforts are needed.
3) Detailed research should be conducted for state and local areas on projected occupational needs, the nation's future manpower training requirements and supplies, employer training policies and methods and assessment of methods of stimulating and removing barriers to training in industry.
4) Research needs to be done, perhaps through case studies, on the entire cost of training. This study should also include the cost of supportive services provided in specific occupations by employers and other agencies.

5) Since most workers are informally trained on the job and since very little, if any, information is available about this type of job training in industry, it appears that research is needed about the relationship between informal and formal training upon selected types of workers in various settings and occupational groupings to determine which type, either informal or formal training, is more effective for a particular type of worker or in particular industrial or business settings.

6) A thorough review of federal laws and management practices which may serve to discourage job training of employees in industry is needed. This may include child labor laws, fair labor standards act, security and collective bargaining agreements, such as seniority provision and job classification.

7) Research is needed for developing more imaginative planning and programming in the area of upgrading. Patterns are necessary for breaking down skill levels to a simpler category.

8) Research is needed to fill the information gap about women in the labor force. Specific information needs are: the result of working mothers upon children's behavior, the attitudes of different individuals toward women working, type and purpose of job training for women and perceptions held by children of working women. Also, the economic impact on a family when the wife or mother is laid-off work needs to be researched.

These do not represent all the research needs of job training found in the literature. However, they were more consistently reported than others.

Trends

The synthesis of all the information that the authors reviewed in preparing this report should have provided some rather pronounced trends for job training. Except for several documented items, the job training picture for the future is only the continuance of the present emphasis. A few of these items are:

1) Industry will continue to train the hardcore, unemployed and disadvantaged through incentives from the U.S. Government.
2) Industry says job training is an economic benefit which must be expanded.
3) Vocational education is being urged to broaden its offerings to provide training related to many occupational needs and not for a specific industry.
4) Manpower training will continue to influence job training in industry because it is considered an economic benefit to society as well as the worker.
5) Manpower projection and forecasting will be increased to help vocational technical education and industry to better meet future manpower needs.
6) Cooperative work-study programs will continue to grow as a better method of job training.
7) Career education, if present emphasis continues, will have a marked impact upon the confidence that a worker may approach his vocational-al choice.

Several Documented Reports of Job Training Trends

Between 1972 and the year 2000 employing organizations will have to become involved with training and education. To meet this demand for manpower, the industrial organizations may need to become partially a community college or university *(Bi-Weekly Report of MIS,* March 11, 1970).

Winston (1969a) indicated that today's job trainers' roles are shifting from one of purveyors of information to one of determiners of the most effective tactics to communicate with trainees. He stated further that the job training was less and less interested in trainee performance on generalized tests and more concerned with his actual job performance. Perhaps this points to a trend that trainees like the idea of learning while earning.

The new breed of work force is less easily controlled, less dependent and less willing to work harder. As a result, job designs have taken on new directions, such as the incorporation of job rotation, job enlargement, job enrichment and work simplification tactics (Banta, 1970).

Two reports that identify trends for job training in the future are Belcher (1970) and Lippitt (1969). Belcher took a general view of the future when he broke projected trends down into four main categories, i.e., (1) composition of the work force, (2) rising level of education, (3) mobility of society and (4) changing values and attitudes.

Under "composition of the work force," he predicted that by 1975 there will be 93.6 million people in the work force, of which two-thirds will be in the 20-34 age group. Also, there will be more women workers.

With the rising level of education and demand for training, Belcher indicated that industry will be turning to instructional technology for help in meeting training demands. The present trend of mobility of society will continue to influence industry in providing training to workers as an incentive to keep them from moving.

Finally, Belcher said changing values and attitudes of workers will be the most dramatic trend. These changes are found in the declining emphasis by the worker on work as a duty and an increase demand for more leisure. Accordingly, the future trainee will want to be treated more as an individual, will be less tolerant of authority and organization restraints, and will have different expectations of what to put into a job and what he can receive from it.

Lippitt identified significant trends in the training and development of workers. These trends are:

1) Effectiveness of training based on worker performance and not merely increased trainee knowledge
2) Industry developing in-house job training capabilities rather than depending on outside experts or resources
3) More homogeneity in training groups so that trainees learn to function together as members of a cooperative organization.
4) Instead of vague assurances that training will be desirable for trainees, greater emphasis on goal orientation
5) Learning that is trainee self-activated rather than imposed upon him

6) The application of reinforcement strategies and follow-up experiences for trainees which provide more lasting learning.
7) Reduction in the use of structured nonparticipative approaches to learning and more activities that are action oriented
8) Planning and developing training activities that focus on learning how to learn
9) Demands of evaluation of training instead of accepting the results on faith.

The U.S. Bureau of Labor in a 1970 June report indicated, "eight out of ten jobs to be filled over the next ten years will be filled by young workers with less than a college degree" (NAM, 1970:4). It is evident that vocational and technical education and industry will continue to play a major role in training semi-skilled and skilled workers. Kievit (1971) took the position that vocational education could make a contribution for teaching students how to learn and how to make decisions from an array of alternatives. This, she continued, would be necessary if a student were to gain personal security in a dynamic society, where both cognitive and affective outcomes are needed.

SUMMARY AND CONCLUSION

It is imperative that vocational and technical educators study job training programs and policies in industry in order to alter their curricula to enable students to make a better transition from school to work. In many instances public vocational and technical education institutions have trained workers but industry is often not satisfied with the students' formal preparation. The justification for this assessment may or may not be valid but it is repeatedly given by industry. If one tries to analyze industry's dissatisfaction with the product of vocational and technical education, there appears no common agreement as to what constitutes the problem. For example, some industries want to employ only specifically trained workers, while other firms prefer to train their own new hirees. Some are concerned with attitudes toward work rather than the technical skills to perform the expected work. Attitudes are considered to be best taught as a part of shop instruction.

The issue involved here is that some industries want a broadly trained worker who has a good job attitude and is well-grounded in the basics of education, such as mathematics, science and communication. These industries desire this broadly trained individual because he is more adaptable and flexible to a firm's changing manpower needs. Still other firms want to hire the already-trained worker because money is saved by not having to operate a training facility.

The dilemma for vocational and technical education is which alternate to choose in providing adequate training for its students so they can be effective in meeting industry's manpower needs. Vocational educators recognize that they must align training with manpower needs. The U.S. Department of Labor, through the MDTA, has trained, and is continuing to train the hardcore, the unemployed, and hopes to train the underemployed, plus providing many other types of job-training functions which public vocational and technical education has not been doing.

Repeatedly throughout the study, industry was mostly concerned about people-related problems. If the reported indications are correct, people-related problems in industry will intensify in the future. Thus, educators will need to provide the student not only with advanced technological skills but also, and perhaps more importantly, with human relations training. To gain this end, both industry and vocational and technical education must begin to communicate better with each other, so that the relationships between instruction, application and employee success can be determined.

It is important to note that industry considers cooperative student training as the best type of vocational and technical education for skill development. It may be difficult to expand this cooperative program to the extent necessary because of the many limits and constraints placed on the operation of a coop program by vocational and technical education, industry, students and federal and

state laws. This cooperative venture of training students for industry appears to be an ideal technique to provide the greatest benefits for closing the gap between school and work.

Large industries are making great progress in improving job training. They are accomplishing this task through the use of systems approach and better evaluation strategies. If vocational and technical education, like all of education, tries to improve its curriculum and instruction from within, stagnation may result. What is needed for improvement is an interdisciplinary team effort which brings society's total energies to bear on solving worker-training problems. In essence, vocational and technical education should do what many industries have done, that is, confer with many disciplines, i.e., psychology, sociology, economics, and the like, in order to gain the necessary knowledge for better utilizing human resources.

Needed Research on Job Training

The following gives specific examples of needed research:

1) On how a large number of capable workers in various industries and occupations acquire their skills training.
2) On the work-life patterns of individuals within various socio-economic groups and their relationship of how best to train and retrain them
3) To identify deterrents of training and to determine the critical factors in employers' decisions to train or not to train
4) On determining the ways and means of disseminating the most promising job training program strategies and tactics to all interested consumers of such information
5) On developing a comprehensive and reliable system of statistical reporting that will permit a continuous and systematic accounting of the nature and scope of job training in private industry (This research should provide detailed information on enrollments in and completion of job training programs by occupation, industry and type of job training.)
6) On the procedure for developing and installing evaluation strategies and tactics into industrial training programs and federal manpower projects
7) To determine the economic benefit of various types of industrial job training and retraining programs on the American worker
8) On what knowledge from the general high school program is useful for industry apart from specific job training
9) On cost benefits of providing semiskilled and skilled job training through private industry versus vocational and technical education
10) On determining the best ways and means of training a vocational education student to make the transfer from school to industry
11) On how to build better cooperative linkages between industry and vocational and technical education
12) On how other countries determine job training needs, accomplish training needs and the effectiveness of their efforts to meet these needs

13) On how the worker can gain the best job related attitude.

The accomplishment of this needed research will naturally lead to still further research. It is certainly evident that gaps exist in our present knowledge about job training in industry. In addition, gaps exist in what specific effects public vocational and technical education has on improving the changes for a student to succeed in industry. To close these gaps will require a much greater resource base than heretofore has been provided.

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